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The Importance of Social Service and Follow-Up in Preventing Blindness*

Conrad Berens, M.D.

THE National Society for the Prevention of Blindness will co-operate next fall with Washington University, St. Louis, and the Massachusetts Eye and Ear Infirmary, Boston, in giving special training courses for medical social service workers in eye hospitals and clinics. The following article is a good introduction to the subject

FROM the study of hospital and clinic records and the service rendered to eye patients, it is evident that eye hospitals and clinics without adequate social service departments are doing incomplete and inefficient work and are failing in one of their most important duties, namely, that of preventing blindness.

Before we consider specifically the value of social service and follow-up work in eye clinics, it may be profitable to consider the whole problem of clinic service and especially the great growth of this work in New York City.

Growth of Clinic Service

Fifty years ago there were only twenty-two clinics in New York City; today there are more than 350. Many of these have eye services and in many others treatment is prescribed for conditions which may lead to blindness in the afflicted patient or in his offspring. Since prevention of blindness is accomplished largely through the medium of the eye clinic it is imperative that well-trained social workers who have special knowledge of eye work be in attendance during clinic sessions. Many eye clinics in New York City today have no social workers in attendance and this is also

* Read before a meeting of the Welfare Council of New York City, February 29, 1932.

true of many other clinics where conditions which may result in blindness are treated. I know of only one eye clinic in New York City in which there is a sufficient number of social workers to assure adequate care for the patients. One great eye clinic treating 30,000 new eye patients a year has the full time of one social worker and the half-time of another.

The increasing scope of the dispensary service also makes the aid of the social worker more necessary. The original dispensary was composed of a general practitioner and possibly a pharmacist. Today we have not only the medical and surgical clinics but the gynecologic, genito-urinary, pediatric, dental, mental, neurologic, orthopedic, eye, ear, nose and throat, obstetric, proctologic, cardiologic, tuberculosis, immunologic, and physiotherapy clinics, not to mention special clinics for health examinations, nutrition, and many laboratory services—bacteriologic, pathologic, roentgenologic, etc. In addition to this the clinics have their nursing service, health education, medical education, and, last but not least, research departments. A social service worker can interpret to the patient the relationship any one of these services may bear to his particular eye difficulty; she can see that proper care is obtained from such departments as may be indicated and that the necessary reports are available to the ophthalmologist.

The Great Importance of the Out-Patient Service in Ophthalmology

It is fortunate that the out-patient is receiving more and more attention because it is here that the earliest signs of disease are detected and the most valuable work in prevention can be accomplished. In 1923, when making special studies of the clinics in New York, we found that, in 45 member institutions of the associated out-patient clinics, four patients were treated in the clinic to one in the ward. In other words, there were 287,000 ward patients and over a million clinic patients. If work of any value in the prevention of blindness is to be carried out, it must be begun in the clinic. Our studies showed that too many patients who have eye diseases which may result in blindness attend the clinic only once. Naturally, some of these patients go to other clinics or to private physicians. It is also true, though unfortunate, that a certain number are permanently blind because they did not understand the serious-

ness of their condition or because some unforeseen incident prevented their return to the clinic.

A well-organized social service department with adequate personnel will certainly prevent much unnecessary blindness. The inadequacy of the system in most clinics was shown by a special study of 5,200 records in five representative eye clinics in New York. In 1922 it was found that of 193 patients who had serious eye diseases which might result in blindness unless given continuous medical care, 103 attended the clinic only once. One of our most striking findings was that 81 per cent of the patients with glaucoma made three visits or less, and it is well known that in this disease the patient should be observed from time to time during the remainder of his life.

What are Some of the Functions of the Social Service Department in Relation to an Eye Service?

Reports on the personality and environment of the patient and assistance in overcoming obstacles in his treatment are important functions of the social service department. Sometimes provision must be made for escorting to the hospital those patients who are feeble or have greatly reduced vision; sometimes the purchase of medicine or glasses for those who are unable to buy them may aid in preventing blindness. Partially blind patients are sometimes placed in sight conservation classes. In some cases home treatment must be provided and in other cases patients must be directed to institutions for the blind. Persistent follow-up of those who have been operated upon and of those whose eye diseases may result in blindness is a valuable service of the social worker. Finally, the well-organized social service department will correlate the work of the many departments of the hospital and assure completion of the records so that they may be available for research, teaching, and educational work.

The Value of a Follow-up System in Preventing Blindness

The first question probably will be: Why have a follow-up system? If the patient wants to come back, he will come back; if not, he will stay away. This, however, is not true in practice because it has been found that before follow-up systems were instituted, from

50 to 75 per cent of the patients failed to return after the first visit. With the follow-up system the number of patients who fail to return is reduced to 20 per cent or less in most clinics.

Of course, it is impractical to follow all cases in the clinic, but the associated out-patient clinics of New York suggested a group of cases which should be followed up in ophthalmological clinics; among these were cases of glaucoma, optic atrophy, uveitis, retinitis, trachoma, and several other diseases. If it were possible to follow only one group, for example, the glaucoma group, the workers would be amply repaid by the number of patients who would be spared permanent blindness.

Follow-up Work as Applied to the Care of Certain Eye Diseases

Cataract.—The social worker interprets the diagnosis to the patient, seeks his co-operation, and endeavors to remove any obstacle which may block the effectiveness of the prescribed treatment. Some of the greatest authorities believe that the development of certain types of cataract can sometimes be arrested in the early stages and at times the vision may even be improved.

Since many cataracts are complicated by inflammatory diseases, the removal of foci of infection and the improvement of the patient's hygiene are most essential. The social worker may be the factor in making this possible. Knowing that individuals, exposed to excessive glare and heat while working, are prone to cataracts, it is important that working conditions be controlled.

Because conditions that interfere with the nutrition of the mother may result in development of cataract of the newborn child, prenatal care should include proper nourishment of the mother.

Patients sometimes become discouraged because they do not see well as soon as the cataract is removed and if the patient is told by the social worker that he will probably see well eventually, especially after glasses have been prescribed, and that he cannot expect to see well immediately with an organ he has not used for several years, valuable service can be rendered.

Syphilis of the Eye.—The interpretation of the disease in its relation to the eyes and the need of prolonged treatment by the syphilologist should be made clear to the patient or his guardian by the social service worker. During the long period of treatment she

may assist in sustaining the morale of the patient, in improving his hygiene, and by offering suitable opportunities for education to children whose vision is already affected. When syphilis is found in one member of a family, serious complications may sometimes be prevented in other members of the same family by careful studies of their blood.

Tuberculosis of the Eye.—This serious disease, which causes a large amount of blindness, is one in which the social worker can play an important part by studying the patient's environment, improving living conditions and diet, and by seeing that the patient is able to receive continued supervision and treatment. Arranging for convalescent care and subsequent employment may mean not only the saving of vision but also of life.

Glaucoma.—In the surgical treatment of glaucoma, the social worker can be of invaluable service to the patient. In two respects particularly is this possible: first, by making clear to the patient the character of the disease, and that peripheral vision (sight on all sides) is first destroyed while central vision (sight in the center) may be normal, but somewhat limited; and second, by pointing out the necessity for operation without delay when it is indicated, because successful operation in chronic glaucoma will improve the vision but slightly, since a certain amount of destruction has already taken place through the increased pressure in the eyeball. Furthermore, if operation is delayed so long that the eye is almost blind, operation is useless, and need not be performed except perhaps for relief of pain or for preservation of the eyeball. It must be understood also that the risks of surgical treatment depend not only upon the skill of the surgeon, but also upon the hours of delay before operation and the character or type of glaucoma for which operation is performed. When glaucoma is of the acute congestive type, when pain is intense and the vision suddenly reduced to counting fingers, operation is usually accepted without delay, and the successful operation is gratifying because the pain is relieved and the vision may be completely restored. It is important to remember that after the operation has been performed, the same medical social care is necessary and imperative as that required previous to operation. The most important function of the social worker is to see that patients with glaucoma have continued care

of their eyes, that they understand that they will probably have to use drops in their eyes the remainder of their lives even if they are operated upon. She should also see that complete general studies of the patient are made and that everything possible is done to improve the general health and eliminate causes of nervous strain, because it has long been realized that a glaucomatous eye is a "sick eye in a sick body."

A close follow-up of all glaucomatous patients and a knowledge of their habits and social backgrounds are most important. The social worker strives to avert worry on the part of the patient, both by the interpretation of the disease and in the explanation of the treatment. The patient should be safeguarded from family annoyances by enlisting the interest of his kinsfolk and making clear to them the dangers of the disease.

Relief from symptoms, and not a cure, is all that can be expected in the treatment of glaucoma; therefore, continuous observation is imperative when the patient is under miotics; and also after operation, lest unobserved progress be missed when prompt treatment or a second operation might avert disaster.

Corneal Ulcer.—The social worker must ascertain the cause of corneal ulcer and its gravity in order to make the interpretation correctly to the patient and to advise him intelligently as to hygienic measures. Much may depend on an improved standard of living. A wholesome diet is all-important, as is attention to sanitary precautions to avoid transmission of the infection. Teaching the housewife economical purchasing and preparation of food may be considered time well spent by the social worker, who can impress on parents the handicap which scars from improperly treated ulcers may be to the future earning power of their children.

Conditions of work in the case of employed persons should be explained to the physician in order that he may advise suitable precautions or a change of occupation when necessary. Proper illumination of working places is important as in some instances protection of the eyes from improperly placed or excessive light will make it possible for the patient to continue his occupation.

Trachoma.—In trachoma, if the cornea is involved or if photophobia (fear of light) and disturbance of vision are noticeable, protracted use of the eyes may be harmful. During the stage of

purulent discharge from the eyes, exclusion of trachomatous children from school is justified, as is insistence on sanitary precautions which should be followed in the case of all eye disease of either frankly or questionably infectious nature. The social worker is essential in making these arrangements.

Papilledema.—Every case of papilledema is a social problem. The social worker may be of great assistance in keeping the patient loyal to one clinic or hospital so that a diagnosis may be made and proper treatment instituted.

When the breadwinner of the family is afflicted the social worker's help in solving the economic problem and in making necessary adjustments is invaluable.

Optic Neuritis.—In general, when occurring with an infectious disease such as influenza or pneumonia, optic neuritis appears during the acute stages of the disease and not in the course of convalescence. However, by watching for symptoms of eye troubles after acute infections, the social worker may occasionally be of value in helping to discover a beginning inflammation caused by latent infection in the sinus or upper respiratory tract.

Headaches with nausea and disturbance of vision may be indicative of brain tumor, particularly if accompanied by weakness of hands or feet. Though not of frequent occurrence, the social worker should be aware of this and of the seriousness of any inflammatory condition in connection with the optic nerve. Early recognition and treatment may be the means not only of saving a patient's sight, but life itself.

Senile Macular Disease.—This is a disease usually seen in adults. It affects the center of the back of the eye where vision is most acute and often progresses to such a degree that the patient is unable to read. If patients with senile macular disease are seen early and the cause is determined and eliminated, useful vision may be retained. This is only possible by obtaining the patient's continued attendance at the clinic and by co-ordinating the various services in order that the patient may be thoroughly studied from every standpoint.

Strabismus (Squint).—The fallacy that squint will usually be outgrown should be combated, because these so-called cures by nature are usually more apparent than real. Examination of the eyes

in supposedly cured squint usually reveals a marked degree of squint and also partial blindness from non-use of one eye. The reason the eye becomes relatively straight is that it is partially blind and is no longer so annoying to the patient. Children with squint should be examined immediately, proper glasses prescribed even at the age of one year, and exercises to improve vision and obtain simultaneous use of the eyes instituted. The social worker may render service by stressing the necessity for continued supervision and operation when the ophthalmologist is certain that glasses and exercises no longer offer hope of permanent cure.

Progress Attributable to Social Service in Eye Clinics

In a restudy of the recommendations made at the time of the 1922 survey of eye clinics referred to above, it is appalling to find how large a proportion of the records are still incomplete, and how few of the serious eye cases registered at that time ever came to the attention of the social service department. It is evident that in spite of the original investigation and recommendations social service departments have only to a very limited extent been utilized in keeping patients under observation until treatment was completed, with the inevitable sequel of increasing blindness and unnecessarily impaired vision.

A recent study of 47 eye clinics in Manhattan, Bronx, Brooklyn and Queens showed that social service is available for 31 of these clinics. It is evident that the ophthalmologists themselves do not always recognize the value of social service and follow-up work in the care of their patients. The reasons why social service is not available in 14 of the 47 eye clinics are varied. In some cases it was because there were no social service departments; in others the departments were too busy, and in others the ophthalmologists themselves did not demand this service. It was also shown that there was so much work to be done in these clinics that only three of the 47 have any systematic follow-up. From these studies it was quite evident that more social service workers are needed; that the physician should be instructed to use the social service department, and that more follow-up work is needed to assure the proper treatment of patients, to conserve the physician's time in making his records valuable for research and teaching, and to prevent blindness.

It was also evident from these studies that follow-up work, to be really successful, must begin with the physician and is most effective if he can gain the confidence of the patient by his thoroughness, his personality, and particularly by his interest in the patient. Confidence will be increased if the physician has time to explain the condition to the patient personally; if not, the day may yet be saved if the social worker can explain the condition to the patient and show a real interest in his welfare. Written instructions and explanations are of value to supplement interviews and consultations. Several pamphlets* giving written instructions to patients have been prepared by the Committee on the Development of Social Service in Eye Clinics. They have the following titles: Information for Those Who Have Areas of Opacity in the Crystalline Lens (Cataract); Information for Those Who Have Myopia; Information for Teaching Those Who Have Ocular Syphilis; Information for Those Who Have Phlyctenular Keratoconjunctivitis; and Information for Those Who Have Glaucoma.

The type of follow-through suggested, then, is really "case control" which anticipates and prevents the usual reasons for incompleted and unsuccessful treatment.

Conclusions

The most valuable work in preventing blindness is undoubtedly to be done in the eye clinic. Evidence in this paper indicates that much blindness could be prevented if the lack or inadequacy of social service and follow-up work could be overcome and its great possibilities fully appreciated by ophthalmologists and hospital and clinic trustees.

*These may be obtained from the National Society for the Prevention of Blindness, 450 Seventh Avenue, New York, N. Y.

Eye Accidents in Child Play

C. Edith Kerby

SOME eye injuries to children may be prevented by legal provisions or regulations—but the greater responsibility rests with parents, who must be educated to the dangers inherent in certain toys and other objects commonly used by children in play. Here is the report of a study on this subject which has just been completed by the National Society for the Prevention of Blindness

IN THE various residential and day schools and classes for the blind in the United States, there are approximately 500 pupils who have been blinded by accident. Each year about 70 new pupils whose blindness is due to this cause are added to the total registration. Of course, trauma (or accident) is not the most important cause of blindness among students in such institutions; on the average about one out of 11 is so blinded. It is true also that, compared with the total school enrollment of 28 millions in the country, the figure is not large. From this point of view one might perhaps be tempted to dismiss the subject as having too little significance, particularly if one can obtain peace of mind by assuming the fatalist's attitude that accidents are inevitable. But there is another angle of approach—the human angle. To the 500 children affected, and to their relatives, friends and physicians, such accidents have the significance of major tragedies. They ask, "Cannot these accidents be avoided?"

As a matter of fact the present study was set in motion by the appeal of a prominent ophthalmologist in New York City, who, during the spring of 1931, had worked in vain to save the vision of three children after they had been severely injured by B.B. guns and arrows.

Our inquiry started as an investigation to discover what legal measures had been adopted locally to prevent accidents from air

rifles and similar devices. To the governors of all states, the mayors of cities with a population of 50,000 or more, and the executives of local safety councils, a request was addressed for information concerning the legal provisions for prohibiting or regulating the sale or use of air rifles and similar devices. In addition, a summary was made of the eye casualties reported in the newspapers of the entire country during the months of June, July and August to determine how frequently such accidents occur and what other causes are proving serious eye hazards to children.

The air rifle in child play can seriously damage the eye.

Naturally, returns from these sources do not give us a complete picture of the situation. They are, however, sufficient to show what the chief hazards are, to serve as a basis for estimating the extent and importance of the problem and to suggest the steps that may be taken to reduce the number of casualties of this type.

Data on eye accidents of children as gathered from newspaper clippings are chiefly important for the information they give us concerning the causes of eye accidents. The percentages given in Table I show the probable distribution, by cause, of children's eye accident cases during a year, after adjustment has been made for seasonal variations.

TABLE I. ESTIMATED DISTRIBUTION OF CHILDREN'S EYE ACCIDENTS BY CAUSE, AS INDICATED IN NEWSPAPER REPORTS*

Cause	Per cent of total cases occurring
WEAPONS	31
Air rifles, B.B. guns, shotguns and other small calibre rifles 12%, blank cartridge and cap pistols 3%, large calibre firearms 1%, homemade guns and cannons 2%, slingshots and rubber band flippers 7%, arrows 2%, stones and other objects used as missiles 3%, tear gas guns 1%	
FIREWORKS	23
Firecrackers 13%, torpedoes and bombs 8%, fireworks (including night fireworks and unspecified) 2%	
EXPLOSIVES	10
Gunpowder and dynamite (including empty cartridges, caps and cannisters) 6%, chemicals used in experiments 2%, other explosives (including gasoline and pop bottles) 2%	
SHARP POINTED OBJECTS	11
Knives and scissors 3%, sticks, nails, wires and hooks 8%	
FLYING PARTICLES	8
Chips of steel, wood, glass 5%, dust, sand and other objects 3%	
GAMES AND SPORTS	5
Baseballs and bats 1%, golf balls and clubs 1.5%, horseshoes 0.5%, fishing and swimming 0.5%, spinning toys (tops and propellers) 1.5%	
AUTOMOBILE ACCIDENTS	3.5
FALLS	3
BURNS (chemicals and hot objects)	2
ALL OTHER	3.5
ALL CAUSES	100%

* Since cases were available for a three-month period only, the yearly totals have been estimated at 4 times the total for June, July, and August, except for sports, which were included as having only a three or six months' season, and fireworks, which were increased by only 10 per cent to cover Christmas celebrations in the South.

No figures are shown in the table for either the actual number of cases reported during the three-month period or an estimated total for the year, since it is felt that the number of cases obtained from this one source would be far below the actual total. This proved to be true in the case of New York City where a check-up showed that only half of the fireworks cases treated in the eye clinics were reported in the newspapers, although most of the dailies had featured special summaries of "Fourth of July casualties." For air rifle and other weapon cases the proportion of cases noted in the press was very much less. Likewise, when the number of cases involving blindness of both eyes as reported in the papers is compared with the figure for the number of such new pupils registered in schools for the blind, it is found that apparently not more than half of the cases are being picked up by the press. If this is true, it is probable the number of eye accidents to children occurring in a single year may run into the thousands.*

Weapons as Causes of Accidents

A glance at the figures in Table I will show that more than one-half (54 per cent) of the eye accidents to children are due to two groups of causes—weapons and fireworks—and that of these two the weapon group** is the more important. The latter fact will no doubt be a surprise to many people who still think that the "toy" gun in any of its various forms is a proper plaything for a child.

The detailed figures for the different types of weapons are of interest. The most numerous group (12 per cent) is caused by the small calibre rifle commonly known as an air rifle or B.B. gun. Such guns are eagerly desired by boys who wish a "real" gun like Dad's. Very realistic indeed is the damage that such a gun may cause to the eye which is struck during a game involving war, banditry or hunting. Moreover, it is by no means sufficient insurance against accident to confine the original gift to the older teen-age boy or to present the rifle without ammunition. The younger

* Our estimated annual total of cases noted in the newspaper, based on three-months' experience, shows from 750 to 1,000 accidents.

** The figure 31 per cent for this group is believed to be conservative since it is estimated as four times the actual total for June, July and August, with no allowance for increased activity during the fall hunting season or following Christmas when there are many newly acquired "toy" guns.

boy can easily come into possession of the gun by borrowing or swapping and he or his small sister may inadvertently come within range of the gun, while an unloaded gun is only a challenge to the ingenuity of the child himself to supply his own ammunition.

Among the other types of weapons which are causing eye disasters are the blank cartridge and cap pistols, often considered safe because they contain no projectiles, but dangerous to the user since the flash which occurs as the gun is aimed and fired is very near the eye. Then there are the large calibre firearms belonging to adults but sometimes left around where a child may handle them, and the homemade guns and cannons with their uncertain actions. Slingshots and rubber band flippers of various types are usually homemade affairs having a serious twofold hazard. With them a missile may be projected with considerable force into the eye of a bystander, or they may snap back and strike the user. It will be noted in Table 1 that this type of accident stands second in importance among the weapon group. The remainder of the accidents in this group were caused by arrows, stones and other objects used as missiles and, in a few cases, by tear gas guns, the latest adult weapon containing chemicals capable of producing acid burns.

Fireworks

Fireworks cause 23 per cent of all eye accidents to children. It is extremely fortunate for the children that this type of plaything is not available for the celebration of all holidays. An idea of the seriousness of this hazard may be gained by noting that the boys and girls of the United States are exposed to more eye hazards during a few days around July 4 than they are during 100 days at any other time of the year. The variations in the circumstances of firecracker accidents are usually such as to increase the eye hazard—for example, holding the firecracker in the hand brings it nearer to the eye, while placing it in a bottle, tin can, iron pipe, etc., makes a bigger and better explosion and incidentally the fragments hurled about are more destructive.

Torpedoes with their contents of small pebbles, so admirably suited for penetrating the eyeball, are also a prolific source of trouble. About 8 per cent of all cases are due to them.

Similar in nature to both the weapon and fireworks groups are the accidents which are due to explosives—10 per cent of all cases. Supposedly empty gun-powder cannisters, blasting caps, etc., are responsible for most of these cases. Moreover, most of the cases of

Supervised play offers safety and excitement

this type have extremely serious results. For example, in a single explosion in which a boy applied a burning match to a dynamite percussion cap, three boys received permanent injuries, two of them involving the eyes.*

Sharp Objects and Flying Particles

Another variety of eye hazard which is not only numerous (11 per cent of the total cases) but very serious in its consequences is the group due to sharp or pointed objects. This is, moreover, a type of accident which is comparatively frequent among the younger age groups, the preschool child or the younger school child. The little child's skill in manipulating articles such as jack-knives or scissors is none too sure and when the inevitable slip occurs the eye of the child or his playmate may be perilously close. Too frequently, also, one finds a child, too young to have the slightest conception of safety, brandishing a pointed stick with utter abandon. That there are not more accidents from this cause seems quite miraculous. Then there are the objects so placed that they are on the eye level of the child who may run against them in his play. One of the most tragic casualties in this group was the result of an encounter with a lilac bush. A little girl ran against the bush in her play, getting a tiny splinter of the wood into her eye. Lockjaw developed and the child died.

Flying particles caused 8 per cent of the eye accidents. These cases may be divided into two main divisions. First, there are the cases in which a chip of wood, steel, etc., flies into the eye during a carpentry or wood-chopping job. Incidentally, adults should be reminded that in an industrial plant employees have the protection of goggles while working at occupations of this nature. The second division includes accidents caused by dirt, cinders or sand set in motion by the wind or other forces. In any family minor accidents of this sort occur almost daily with no serious consequences. Danger from infection arises when the cornea of the eye is scratched either by the particle or by the untrained person who is called upon to give first aid.

* Of special interest in this connection is the safety education material on the subject of blasting caps as a cause of children's accidents, which is issued by the Institute of Makers of Explosives. Posters, leaflets and a motion picture film may be obtained upon application to the office of the Institute at 103 Park Avenue, New York City.

Other Hazards in Play

Apparently most outdoor games and sports are comparatively free from eye hazards. Not many kinds of games were reported as causing accidents. The total for all those noted was found to be about 5 per cent.

Among the less frequent types of eye accidents are those due to automobile accidents, to falls and to burns. The auto accidents noted in this study included some in which the eyes were cut by broken glass and also some involving blows on the eye or head. In one of the latter cases the blow was of such force that the eye was knocked out. Similar results may also occur in falling. The burn cases were due in part to chemicals (such as iodine and ammonia) splashing into the eye and in part to hot objects (such as a curling iron and a lighted cigarette).

In passing, it should be mentioned that the victims of eye accidents are usually boys, the proportion on the average being one girl to four boys. Girls do not go in for adventures involving fireworks, firearms, and explosives in a large way, although they are not always able to keep out of range of the more daring sex.

Legislation Necessary to Prevent Play Accidents

Having called attention to the destructive qualities inherent in certain playthings which are commonly allowed children, it would seem that no further argument is necessary to prove that it is the plain duty of adults to see to it that boys and girls are deprived of these so-called "toys." The only question is how this may be accomplished.

In the case of articles which are produced entirely for the toy trade the obvious method would seem to be to prohibit their manufacture and sale, thus cutting off the supply at its source. Air rifles, cap pistols, slingshots, darts and similar devices for projecting missiles by means of springs, compressed air, etc., as well as fireworks (exclusive of the display types) and all of their homemade substitutes, fall into this class and could well be dispensed with. In addition, the exchange, use and possession of many articles such as display fireworks, firearms and explosives, could be so controlled as to prevent the possibility of their coming into the possession of children and youths. A reference to the table on

causes will suffice to show that if such a program of legislation could be made effective throughout the country the number of eye accidents to children could be reduced by more than half.

Let us see what the records show about existing legislation and its enforcement. Since our study was started as an inquiry into the eye hazard from air rifles and similar devices, the information which we have as to local ordinances covers that subject only. As noted above, we requested copies of all state laws and of city ordinances in the group of 183 cities having a population of 50,000 or over.

In general, this subject has not been made a matter for state regulation, but comes under the police powers of the individual cities. Of the 134 cities for which reports were received on this subject, 27, or one-fifth, have no prohibiting ordinances whatever and five have only partial protection under their general firearms laws or police confiscation rulings. The 102 cities having specific legislation, either in state laws or local ordinances, or both, show a very considerable variety in scope. In order that the reader may have a general picture of the nature of such legislation, we give in Table II a brief summary showing the types of articles prohibited and the nature of the prohibition.

TABLE II. LEGISLATIVE REGULATIONS CONCERNING AIR RIFLES AND SIMILAR DEVICES, CLASSIFIED BY ARTICLES COVERED AND ACTS PROHIBITED*

Type of articles prohibited	Per cent of reporting cities having laws prohibiting:				
	Manufacture	Sale	Use	Possession	One or more of specified acts
Air rifles and air guns	1	31	48	21	63
Toy guns or pistols	..	28	20	10	34
Slingshots or similar devices	14	19	19	24	34
Bows and arrows or darts	..	..	7	3	7
Missiles or projectiles	..	2	22	7	24
One or more articles	9	37	63	38	76
All articles specified above	..	13	11	4	..

* Based on reports from 134 of the 183 cities with a population of 50,000 or more.

It will be seen that although the proportion of communities having some regulatory provisions covering one or more articles in the weapon group is comparatively high (76 per cent), this must be largely discounted because there are so few cities in which the regulations are either specific or broad enough to cover all types of weapons which are causing eye accidents. For example, only one out of eight cities (13 per cent) prohibits the sale of all of the articles specified, one out of nine cities (11 per cent) prohibits their use, one out of 25 (4 per cent) prohibits their possession. In very few cities is manufacture of such articles forbidden and in these the prohibition refers only to slingshots in every case except Denver, Colorado, which alone forbids the making of air guns. The most commonly mentioned article is the air rifle. About two-thirds (63 per cent) of the cities reporting have ordinances prohibiting their sale, or use, or possession, or two or more of these acts, while only one-third mention in their regulations other types of toy guns and slingshots.

There are a number of exemptions or limitations noted in the regulations. About one-half (38) restrict the legislation to minors of a certain age. Other exemptions are: During military drill (22), with special permit or license (14), in shooting galleries or rifle ranges (10), on private premises (11), with the consent or in the company of parent or guardian (2), and cap pistols (5). Since it is not clear that the permission of parent or police department or the privacy of the grounds would afford adequate protection against accidents to the child, at least these exemptions might well be struck out of the ordinances. Nor should any exception be made in favor of cap pistols which, as we have seen, involve an eye hazard.

As might have been expected, there were actually more cases reported in proportion to population in cities having no ordinances or inadequate regulation than in cities having laws covering the article mentioned as causing the accident. Those cases occurring in cities having adequate legislation point to laxity in enforcement.

Indirectly, through statements made in the newspaper reports of Fourth of July accidents, we learn that progress in the complete elimination of this hazard by law is hampered by the fact that such legislation is not universal. A single small town having no legislation may act as bootlegger and sell fireworks to inhabitants of sur-

rounding communities which are presumably protected by ordinances.

In some of the laws regarding the use of firearms, "the owner or any person having charge or control thereof" is forbidden to permit a minor to handle or use such weapons. Would it not be feasible to include a similar provision covering dangerous articles, such as blasting caps and other explosives, firearms and display fireworks, which must be kept out of the hands of children and others who do not understand their dangers?

No attempt has been made in this article to set up a model ordinance for general adoption throughout the country. Instead we have tried to make clear the *need* for such legislation and in addition to suggest the articles that should be prohibited and, in a general way, the nature of the regulatory provisions that are required to cover the situation.

Summary

Eye accidents to children are probably much more numerous than is generally believed. Moreover, because of the extreme seriousness of a handicap such as blindness, the subject of the elimination of eye hazards from child life is one which deserves the attention of adults. In the schools and classes for the blind in the United States there are 500 pupils whose blindness is due to accidents and about 70 are added each year.

Findings of a study in which newspaper reports were used as a basis indicate that almost two-thirds of the eye accidents to children are due to weapons (air rifles, slingshots, arrows, etc.), fireworks and explosives.

For the purpose of eliminating the hazards from weapons, fireworks and explosives the National Society for the Prevention of Blindness would strongly recommend that prohibitory legislation be passed where it is not now in force and, in communities having partial provision only, that ordinances be strengthened and broadened. At present legislative provisions on these subjects are far from adequate in that they neither cover all of the articles which are proving dangerous or all of the acts which should be prohibited.

It is suggested that all articles such as air rifles, cap pistols, slingshots, darts, other devices for projecting missiles, firecrackers,

torpedoes, etc., which are being manufactured for the toy trade should be eliminated at the source by an absolute prohibition on their manufacture and sale. In addition, the exchange, use and possession of articles such as display fireworks, firearms and explosives should be controlled by regulations in which the adult owner or user is made responsible for preventing minors from handling or using them.

Finally, there is need for continued education of both children and adults concerning the eye hazards that are inherent in many objects which children commonly use in their play. Parents, teachers and others interested in the welfare of children are urged to support local authorities in their efforts to obtain and enforce prohibitory regulations covering weapons, fireworks and explosives and to guard the child against dangerous playthings day by day.

Illumination and Eyesight in Industry*

Le Grand H. Hardy, M.D.

IT is estimated that about 40 per cent of industrial workers have defective vision due to ocular defects. This number is probably being increased by unhygienic lighting conditions; and poor illumination augments the ocular deficiencies already present

ALL preventable accidents due to defective eyesight involve at at least two factors. These are illumination and proper vision. Either may bear the burden of responsibility or they may share it. Other factors including the physical, emotional and psychological status of the individual involved, contribute to a greater or less degree in these, as in all preventable accidents, but the influence of proper illumination and proper vision seems so obvious and is yet so disregarded in general industrial practice that it becomes well worth our time to consider some of the means whereby this influence operates.

"Eye fatigue" and defective vision are two of the common causes of accidents. The condition usually is traceable to one of two sources: the environment or the eye. The most common environmental cause of eyestrain or poor vision is defective illumination. To eliminate this cause is, in most cases, not only possible but economically profitable. It has been noted that good illumination is not only cheap but that it is unique among the safety devices in that it assists rather than impedes operation. This notation is worthy of emphasis for it indicates a safety factor which is independent of the intelligence and co-operation of the employee, which avoids the poor psychology of mandates, rules and disciplinary procedures and the costs of educational programs in that it practically always receives the approval of those whom it is

* Presented before the Greater New York Safety Conference, February 24, 1932.

designed to protect; which augments rather than decreases the efficiency of the operator, thus avoiding the criticism directed toward many safety devices; and it increases the morale of the employees.

That the possible benefits to be derived from eliminating this cause of defective vision and accidents have not generally been appreciated, and have but rarely been achieved is the conclusion of all who have studied the subject.

Incidence of Defective Illumination

Of 50,000,000 incandescent lamps installed in our industrial plants, less than 25 per cent are so installed or equipped that they will not produce glare. Glare is but one of the defects of industrial illumination. There are other ways of arriving at the probable incidence of defective illumination and its effects upon vision and accident-rate but, unfortunately, few extensive controlled investigations have been made. This is probably due to the fact that the engineer, like the doctor, hesitates, for the sake of control, to withhold benefits from a large proportion of those who seek his advice. Stimson who made the most valid studies of hundreds of thousands of accident reports, placed, in 1910, the responsibility for 23.8 per cent of 91,000 accidents upon defective illumination. This is roughly one out of every four. Despite the improvement in illumination which has occurred in the past 20 years, his most recent surveys indicate defective illumination or defective vision to be the cause of 15 per cent of our accidents. This is the only controlled study I have discovered. Interesting confirmatory evidence of this relationship is supplied by the British Industrial Safety First Association.

The Cost of Defective Illumination

The Illuminating Engineering Society estimates that we are losing the services of 125,000 men annually through accidents due to poor lighting. These terms have been translated into dollars as follows: if only 15 per cent of industrial accidents are caused by poor lighting, the annual toll is $150,000,000. The direct cost has been shown to be but one-quarter of the total cost due to time lost by fellow employees, foremen, supervisors and other executives, damage to machinery, tools and materials and interference with

production. The public health cost of this condition has never been evaluated satisfactorily.

Defects in Illumination as a Cause of Defective Vision

Some common defects of illumination relate to: (1) Intensity or quantity; (2) quality or spectral composition; (3) distribution; (4) steadiness; (5) diffusion; and (6) direction.

Intensity.—Intensity and distribution have received the most attention as common defects. The most careful survey of these factors has been made by the United States Public Health Service in the New York Post Offices. This is one of the few scientific studies reported and is rapidly becoming a classical reference. While this survey shows definite correlation between improved illumination and efficiency and poor illumination and ocular defects it contains no report of accidents. It may be inferred that the poor efficiency would have resulted in physical accidents in other types of work. That is, if we do not see quickly and accurately we will probably have more accidents. The poor vision may cause an accident either by plunging us into a misunderstood or unperceived situation or by delaying our reaction time until it is too late to avoid an accident. Here a split part of a second may be important. It takes twice as long to see at 3 foot-candles as at 30 foot-candles. Most workers have defective vision. Workers with subnormal vision show the greatest improvement with better lighting. Further, at any illumination, the defective eye requires more time to see. These significant data are presented in graph form in the Standards for School Lighting and laboratory investigations have been verified in practice. Pictures have been published showing the actual conditions under which accidents occurred, and demonstrating the causal relationship between insufficient light and the accident. In one plant there was a 75 per cent decrease in accidents following the installation of modern illumination with no other changes. The results of careful studies by engineers have been incorporated into the Code of Lighting for Factories, Mills and Other Work Places, published by the Illuminating Engineering Society.

Quality of Illumination.—The quality of light refers to the spectral distribution of the energy in that light, and most authorities

agree that the more nearly this approaches diffused daylight the better it is. The type of artificial light generally employed is too yellow. For most work an adjustment of its color value is desirable and, in some instances, where color judgments are to be made, it is essential.

Distribution.—The distribution of light is an exceedingly important factor, for defective distribution is in all likelihood responsible for a large proportion of ocular fatigue and industrial accidents. The ideal situation occurs when the general level of illumination is high with accessory units used to raise up to an efficient level those particular areas where work requiring fine discrimination is to be performed. Even if the amount of light on a particular working area is sufficient or more than sufficient, unless the surrounding areas such as floors, stairs, hallways, etc., are adequately illuminated, the high local value becomes a risk because the eye of the worker, adapted to the bright light, is for some seconds, even minutes, unable to see danger in a relatively dark area. This is one type of glare effect due to marked inequalities in illumination and is one of the most serious of the common defects. If this change in looking from a bright to a dark field occurs but four times an hour, it has been estimated that in a factory using 100 men, each working by an unshaded droplight, there has occurred 3,200 times on each eight-hour shift a condition which is capable of producing an accident.

Unsteadiness.—Unsteadiness of illumination is mainly provocative of fatigue due to the incessant demands upon the eye for readjustment. Cloud or smoke shadows may cause rapid and annoying alterations in light values near windows and the rapid flicker of defective current is extremely tiring.

Diffusion.—Diffusion is related to distribution and shares its importance. Diffused light does not cast sharp, dense shadows which are a prolific cause of the tripping accidents ranked by the insurance companies as first among the industrial hazards. The factor of diffusion has been emphasized not only from the industrial accident, but also from the purely public health point of view. It has been characterized as an important quality of light used to avoid rapid fatigue and the production of eyestrain and Lancaster has indicated a rough test for this quality: a pencil or finger held

several inches from the paper, book, or work to be viewed, should not and will not cast a sharp shadow if the light is properly diffused.

Direction of Light.—Finally, the direction of the light under some conditions may become important. The old tradition that the light should come over the left shoulder is as erroneous as it is misleading. The frequency with which every principle of good lighting is broken and the violation justified by the innocent assertion that the light comes over the left shoulder is surprising. The direction of the light becomes important and sometimes dangerous only under two conditions: (1) When the specular or direct reflection from the work or nearby bright objects is directed into the eye; and (2), when the bright or concentrated source lies in the field of vision, and the effect and danger in this second instance increases rapidly as the line of light approaches the line of sight. Both of these conditions produce glare. If glare is eliminated and the light is properly diffused its direction is unimportant. A possible exception may be made to light coming from below.

The Eyes in Preventing Accidents

The second factor involved in the seeing process is the eye. It is obvious that any amount of perfection in illumination cannot benefit a blind eye, but to this statement we may not attach the corollary that the more perfect the eye the greater will be the benefit it derives from improved illumination. It is because functional and organic defects in eyesight are so very common that they cannot be avoided in industry, and because the defective eye receives proportionately greater benefit from good lighting than does the perfect eye, that I have emphasized the need of attacking this phase of the problem.

We can quickly outline those defects of the eye which result in poor vision and indicate how they may cause accidents but, so far as I am aware, no valid correlation between the individual ocular conditions and accident-rate has ever been reported. These facts are extremely difficult to acquire for a number of reasons, one of which, a psychological factor, has been repeatedly brought to my attention. The man with an organic defect is usually more cautious in situations where that defect is likely to be made manifest, whereas the consciously perfect specimen permits his pride to lead him to

the fall. We all recognize the prominent rôle carelessness plays in accidents. This does not mean that I minimize the importance of ocular defects—to do so would be to compound the carelessness. Rather, I merely want to indicate the difficulties involved in accurately placing the blame for an accident where only functional eye defects can be demonstrated.

Incidence of Defective Vision

Defective vision is a common condition in all stages of life. The Washington Public Health Survey showed 34 per cent of 4,000 school children had defective vision when the examination was made without a cycloplegic, and the number was increased to 59 per cent when a cycloplegic was used. Schereschewsky found that 75 per cent of garment workers had some defect of vision. The United States Public Health post office survey gave intermediate figures which also confirmed the increase of defective vision with age.

Refractive Errors.—What are the refractive errors and how do they affect vision? They may be classified, for our discussion, as: myopia, or nearsightedness; hypermetropia, or farsightedness; astigmatism, complete lack of a focal point due to differences in curvature of the focussing parts of the eye; and presbyopia, or old sight which lacks adequate focussing power. Combinations of these conditions are the rule. Certainly no nearsighted person should be permitted to drive a truck or control a situation where a wide range of clear vision is essential for the safety of himself and others unless he is wearing correcting lenses and, if our safety program is to eliminate as far as possible the necessity for full co-operation, we should find in our organization a place where his visual range may function without increasing the hazards to himself and others. Similarly, the farsighted person should either be placed on a job with minimal requirements for prolonged close application or should be relieved of the strain of such work by suitable lenses. Only a careful testing, not alone of the visual acuity, but also of the amount and range of focussing power and the refractive condition of the eye, will give the information necessary to plan most intelligently for these people.

Muscle Imbalance.—A second group of eye defects frequently associated with the refractive errors and a prolific cause of eyestrain and possibly accidents are the muscular imbalances. They have been found to be the cause of many airplane accidents, especially during flights at high altitudes. I do not think any of us will find much difficulty in visualizing the dangerous predicament occasioned by double vision where a reaction to one image must of necessity be quick and accurate. A test for this condition is simple and should be part of every safety program examination.

Organic Eye Diseases.—A third group of defects includes the organic eye diseases. These act in such a variety of ways (such as aversion of light, distortion of images, tearing, sudden blurring, flashes of light, black spots, etc.) to create situations potentially dangerous that they cannot be considered here. It is neither kind nor safe to permit a man with active ocular disease to jeopardize the safety of himself and those about him by attempting to perform work which requires accurate visual supervision. A single example of such disease may be permitted. Glaucoma, a very serious and progressive eye disease leading usually to blindness unless treated, may show no evidences of its presence by the usual cursory eye tests. The patient may read the test chart perfectly and exhibit quite normal focussing power for his age. His eye may show no external signs of disease and yet he is in tremendous danger himself and may constantly be endangering others. The clue may come from some awkwardness which indicates that he does not see well out of the corner of his eye, and then careful tests will reveal that his fields of vision are greatly restricted. Such a man does not see danger approaching from the side and may suddenly precipitate himself or others into tragic situations as a consequence. What has been said of him applies frequently and in a similar way to persons suffering from certain retinal and optic nerve diseases. Fortunately, they are relatively rare compared with refractive errors and muscular imbalances.

Summary

In summarizing, the following points may be made regarding illumination and defective vision in relation to accidents in industry:

1. Defective illumination is a common and expensive cause of defective eyesight and accidents.

2. The major lighting defects may easily be recognized and in most cases eradicated.

3. The eradication of defective illumination is usually not only practically possible but economically profitable.

4. The best available statistics indicate that about 40 per cent of our industrial workers have defective vision due to ocular defects.

5. This number is probably being increased by unhygienic lighting conditions; and poor illumination augments the ocular deficiencies already present.

6. Refractive errors cause potentially dangerous situations by producing fatigue, reducing physical efficiency, and failing to give adequate warning of danger while there is yet time to avoid it.

7. Muscle imbalances lower the worker's resistance to fatigue and disturb his quick and accurate spatial perceptions which are essential to safe behavior among moving objects.

8. Organic diseases not only reduce vision, both central and peripheral, but by causing distortions, blind spots, illusions, etc., handicap the worker's control of his physical activities.

Recommendations as to Illumination

How can the safety engineer, the employer, the production manager, the industrial physician or nurse be useful in improving lighting conditions?

It has repeatedly been demonstrated that light is cheap compared with labor costs. Some illuminating engineers associated with electrical companies claim it costs less than nothing. Ignoring any statement which appears radical and accepting only the conservative opinion of the Illuminating Engineering Society and American Standards Association, a detailed estimate conservatively based on practical conditions demonstrates that if an operator, because of good illumination, saves—in more production, better quality of product or decreased accidents—the equivalent of only three minutes per day for 300 days, he will offset the annual cost of the illumination.

The obvious application of this information would be to request an illumination survey of the plant or factory by an illuminating

engineer in conference with the plant physician or ophthalmologist. If this is found impractical, or sufficient co-operation cannot be obtained, then any observer with a lively interest, armed only with a copy of the American Standards Code of Lighting, a cheap foot-candle meter, and a reasonable amount of intelligence, can make a survey that may be of incalculable value in reducing accidents, conserving vision and life, and increasing production.

In such a survey the foot-candle meter will indicate the intensity of the light, which may be compared with the values recommended by the American Standards Association for the type of work involved. The quality of light may be roughly judged by the eye—most electric lamps are too yellow, especially in low wattage. The distribution of light is of extreme importance as glare and its evil consequences depend upon this factor. A rough classification of glare and its recognition and measurement are given in the American Standards Code of Lighting. A direct observation on steadiness will frequently reveal an unrecognized but disturbing or fatiguing flicker, or marked and sudden variations due to a daylight component in positions near uncurtained windows. Its diffusion may be tested by a very simple and practical method and, if the other defects are eliminated, its direction is a matter of little importance.

Recommendations as to Correcting Eye Defects

Indubitably, a complete pre-employment and periodic medical examination would serve to lessen the dangers and accident-incidence due to defective vision—especially if these examinations included the services of specialists, particularly ophthalmologists, psychiatrists and illuminating engineers—but such a program is much too Utopian to be included in any practical discussion at the present time.

On the other hand, it is a foolish, expensive and shortsighted policy to do nothing because the ideal facilities for accomplishing our objective are not at hand. The conditions met in industry are so infinite in variety and specific limitation that I can only urge each one interested in promoting safety to do the best he can with the equipment and abilities at his disposal. If the services of an ophthalmologist are not available, then the combination of industrial physician and optometrist may be found satisfactory or, lack-

ing these, a nurse trained in eye work can be of great value if the limits of her training and responsibilities are understood. Lacking any professional assistance whatever, our intelligent, enthusiastic friend who made the illumination survey, can, with a little help which any physician will be glad to supply, carry out some tests which may prove of great value if for no other reason than that they defeat the spirit of indifference and callousness which is to such a great extent responsible for our industrial health and accident bills.

First, to this enthusiast, I would suggest acquiring a copy of the National Society for the Prevention of Blindness Publication No. 77 on "Eye Protection in Industry," which supplies a self-appraisal blank. Next, some visual test cards for both distance and near vision. The technique of using these can soon be acquired. Color tests are easily made with the Ishihara charts, which are the nearest approach to automatic diagnosis I have seen in medicine. A rough confrontation test for loss of side vision is not difficult to apply and, while woefully inadequate, is better than no test at all if reliance is placed only on positive findings. Finally, by noting whether a red glass placed over one eye produces double vision as the eyes follow a small light moved into various positions, and by alternately shifting a cover from one eye to the other as a distant object is viewed and noting whether the covered eye deviates inward, outward, up or down, some of the gross muscle imbalances will be discovered. Every suspicious or positive case should, of course, be referred for expert attention either to a physician or a clinic.

If only these few tests are carried out, I believe they will represent progress and, as they are carried out, their value and the value of the person who performs them will be more and more appreciated.

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Eye Injuries and Sympathetic Ophthalmia*

Bernard Samuels, M.D.

NO one has been able to isolate the micro-organism that causes sympathetic ophthalmia, although it is a specific disease which may be recognized under the microscope. A challenge to pathologists!

THE subject on which we are to speak especially concerns sympathetic ophthalmia, a disease that occurs often after injury to the eyeball. It is a very peculiar malady which, first breaking out in an eye after a perforating wound, causes a similar disease in the uninjured eye. There is nothing else in pathology similar to this. For instance, if there is a boil on one hand, that does not cause a boil on the other hand; but after a perforation in one eye, it may happen that the uninjured eye becomes inflamed.

Sympathetic ophthalmia occurs only when an eyeball is perforated. Practically nothing else will cause it. Perforations usually take place in the cornea, and mostly in an antero-posterior direction. It is fortunate that the majority of perforations are in the cornea, because this area is not so dangerous for the production of sympathetic ophthalmia as when the "white of the eye," namely, the zone around the cornea overlying the delicate vascular structure called the ciliary body, is perforated. This white circumcorneal area is called "the danger zone" of the eye, because it is following perforations in this area that sympathetic ophthalmia is most likely to develop.

Childhood is unfortunately a favorite age for perforations of the globe. Every mother should know the old saying that for children, knives, forks and scissors are not good. Then we skip from

* Abstract of paper presented at the Institute on Conservation of Vision given under the auspices of the New York State Department of Social Welfare, Commission for the Blind, Prevention of Blindness Department, October 29, 1931.

early childhood to manhood. Those who do manual labor, particularly structural steel workers, are exposed to accidents of all kinds to the eye. Eye accidents occur seldom in women and very seldom in old people, all of whom lead more protected lives.

Some perforations are complicated by the presence of a foreign body in the globe. Until thirty years ago very tiny foreign bodies in the eye could not be readily discovered, and there was very little known about them. Then came the day of the X-ray. When it became generally known that there was this marvelous light that enabled one to see a foreign body in the globe, and not only to see the foreign body but to localize the exact spot of the foreign body, there was a great outpouring of all those cases that hitherto had been suspected of having foreign bodies in the eye. They came to have the presence or absence of a foreign body confirmed.

If a foreign body has been retained in an eye for any length of time, it becomes encapsulated by newly formed connective tissue. It makes for itself a bed in which to lie, and then it is impossible to extract it by any method without destroying the organ. It is necessary that every foreign body be removed at the earliest possible moment. If the foreign body is in the eye a few weeks or a few months, and it proves impossible to remove, we understand that it has become embedded.

When a foreign body is introduced into the globe, micro-organisms may be introduced with it. The destruction of the eye comes in this case, not from the damage done by the foreign body, but from the effect of the micro-organisms. There is no better culture media anywhere than the vitreous body that comprises four-fifths of the interior of the eye. Fortunately, a spicule of steel is not likely to be infected because it is heated by the blow of the hammer and so it may enter the eye sterile.

Sometimes it is rather a merciful thing that pus is introduced through the perforating wound because the pus destroys the whole of the interior of the eye, and those eyes in which the entire interior is destroyed do not produce sympathetic ophthalmia.

In observing people who have a shrunken eyeball after perforations, doctors should cultivate the habit of asking how long it has been since the wound occurred. It must be remembered that sympathetic ophthalmia may occur twenty, thirty, or forty years

or more after an injury, although it is likely to break out within a month after the accident. Children are more prone to it than adults.

There are two great classes of intraocular foreign bodies. One type is of organic origin, such as an eyelash or a bit of wood. The other type represents inorganic substances such as steel and copper. These latter are the two chief foreign bodies with which we have to deal. When a foreign body perforates an eye, it is driven with such force that it goes straight through the wall and does not cling to anything. It may even perforate the fibrous tunic of the eye twice, lodging in the orbital tissues back of the eyeball. Its salts are so irritating that they may quickly destroy the eye, just as virulent bacteria do.

A piece of steel the size of the point of a cambric needle can cast a shadow with the X-ray and can be accurately localized. Whenever a visiting nurse suspects the presence of a foreign body, she should advise that the patient be sent to a hospital for an X-ray. Minute foreign bodies go directly through the fibrous coat of the eye like a needle, painlessly. If they stay in the eye a few weeks it often is too late to extract them, and degenerative changes will go on until the sight is lost.

Whenever a piece of steel enters the eye, it does just exactly what it would do if it were wrapped in linen and placed in water. It would stain the linen a rusty brown. Within the interior of the eye a bit of steel sets up immediately a staining process. The staining involves first the tissues around the steel. This direct impregnation of the tissues with the salts of the iron is known as direct siderosis. Later the salts diffuse in all directions so that most of the structures inside the eyeball take on a brownish color. To a blue iris this gives a brownish hue, while it causes a normally brown iris to assume a dull, dirty brown color. In the old days before the time of the X-ray and localization, the color of the iris was all that surgeons had to go by. One should train himself to observe whether both eyes of an individual are of the same color. If one is brown and the other blue and the individual states that both eyes were once brown, it is likely that the blue eye is the weaker eye, disease having made the iris fade out. But if both eyes were once blue, and one has turned brown, this should cause a suspicion that in the brown eye there is a particle of steel dissolving.

Not all of the tissues within the eye become impregnated with the salts of iron. It is mostly structures of epithelial origin that show this affinity. The lens is such a tissue. By dilating the pupil one may see a brownish ring in the lens, representing epithelial cells have taken up the salt of the iron. After the removal of steel the stain may gradually disappear. Eyes containing irritating foreign bodies are very liable to set up sympathizing ophthalmia.

It is unfortunate that we cannot make the diagnosis of sympathetic ophthalmia until the uninjured eye is affected. Therefore, all of us should have in mind that sympathetic ophthalmia is a disease not of one eye but always of both eyes. The disease is an entity—separate and apart from all other diseases. The pathology of sympathetic ophthalmia was first differentiated about forty years ago. In a given case one has to decide what damage was done by bacteria, if infection is present, and, finally, the damage done by the irritating effect of a foreign body, if any is there. Sympathetic ophthalmia is something that is added to that which an ordinary injury would produce. It represents a peculiar infiltration of lymphocytes into the choroid, ciliary body and iris and not an exudation of cells, as is seen in the formation of pus.

Sympathetic ophthalmia is a specific disease. It may be recognized under the microscope. The only weakness in the picture is that nobody yet has been able to isolate the micro-organism that causes it. The disease itself, so far as we can see it microscopically, looks almost exactly like tuberculosis. It is thought that it may be caused by some micro-organism similar to the tubercle bacillus, introduced into the wound. The question disturbs the pathological world today.

In the matter of advising the removal of an eye that has suffered from a perforation in the region of the ciliary body, the surgeon is guided by the following rule: If the vision is failing; if the eye is soft; if it is painful; and if the wound is retracted—then removal is indicated. One cannot say that such an eye will produce sympathetic ophthalmia, but it may. Unfortunately, there is no way of diagnosing the onset of sympathetic ophthalmia until the uninjured eye is already inflamed. Then but little can be done. The uninjured, sympathizing eye may in the end be blind while the injured eye may retain some slight vision.

Conserving Vision—An Integral Function of the Missouri Commission for the Blind

Francia Baird Crocker, R.N.

MISSOURI has long been known as a "Show You" state in matters pertaining to welfare work for the blind or research and education toward prevention of blindness. This article is one of a series which we are publishing, describing the conservation of vision programs in various states

SHOULD organizations doing work for the blind participate in active measures to prevent blindness?

In the office of the Missouri Commission for the Blind are records of over 6,600 persons who are industrially blind, and the Commission is concerned with the social adjustment of the adults of this group. To make social plans for these adults the Commission establishes an eye diagnosis to determine if visual impairment is to be temporary or permanent. As a result of the work with this large number of persons, attention has been focused on eye affections which can be treated and blindness prevented. The Commission has a definite responsibility in regard to individuals needing eye care; either it refers them to an agency charged with the duty of conservation of vision and prevention of blindness, or, in the absence of such an organization, the Commission must take active measures to restore vision before making extensive plans for social rehabilitation. This is not contrary to, or a startling departure from, the programs of other fields of social work based on sound principles, which attempt to assume their part of the community or state responsibility, not only in ameliorating social situations, but in preventing them from arising in so far as it is possible to do so.

The Missouri Commission for the Blind was created in 1915 by Act of the General Assembly. At the outset, the members realized

the urgency of stressing a program to prevent blindness, but the limited funds at the disposal of the Commission during its first ten years of existence greatly restricted the development of this work. Sporadic efforts were made as funds permitted, but it was not until January, 1929, that a separate department was established within the Commission for this purpose.

Aside from humanitarian reasons for conserving vision and preventing blindness, there is an economic factor of eclipsing proportions to be considered, namely, the cost of administration and disbursement of the state pension for the blind which amounts to more than $1,000,000 annually, as more than half of the 6,600 blind persons in Missouri receive the state pension for the blind. Accepting the statement made by authorities that two-thirds of all blindness can be prevented if taken in time, approximately $720,000 of the annual expenditure of more than $1,000,000 a year in state pensions is being paid to persons who need never have become blind.

Relation of the Department for Prevention of Blindness to Other Departments of the Commission

In addition to the department for prevention of blindness, there are five other departments in the Commission: home teaching, pension, home work, placement, and shops and sales. There are nine home teachers and a supervisor, all of whom are blind, in the home teaching department. These representatives visit the adult blind men and women in their homes, instruct them in simple handicrafts and in reading and writing raised types, and help them in many ways to become adjusted to their visual handicap. The pension department is responsible for investigating applications for the pension and certifying those applicants who are eligible to the auditor of the state. The home work department gives employment to blind men and women in their homes and finds a market for the finished products. The placement department secures employment for blind men and women in industries and independent enterprises, while the shops and sales department has charge of the St. Louis Broom Shop and acts in an advisory and supervisory capacity to the other five shops in the state. The department for prevention of blindness has a duty to fulfill in relation to each of these departments.

Home Teaching Department

Accepting blindness without investigation as to the cause or the possibility of improving vision and teaching individuals braille or handicrafts not only wastes the teachers' time and deprives other blind persons of instruction, but also has a deleterious effect upon the individual who goes through a period of personal readjustment in order to compensate for a visual handicap which might have been removed.

The department for prevention of blindness renders its greatest service to the home teaching department in securing and interpreting diagnoses and in estimating the visual efficiency of the individuals coming to the attention of the home teachers. The home teachers must know if the individual is to be considered as one who comes within their services from the standpoint of vision; what is the social significance of the diagnosis; is the condition progressive or infectious; is treatment indicated, and if so what will be the probable outcome? The service the home teacher renders may be limited or modified by the eye findings. On the other hand the medical evidence may hasten social planning.

Pension Department

Applicants for the blind pension are examined by one of the examining staff, which is composed of fifty-nine ophthalmologists, all of whom hold the certificate of the American Board for Ophthalmic Examinations. The amount of vision, diagnosis, cause of blindness, and recommendations for treatment are given on the eye affidavit. Written into the pension law is the following clause: "No person shall be entitled to the benefits of this act who shall refuse to submit to treatment or operation to effect a cure when recommended by the examining oculist and approved by the Commission; but upon submission to such treatment or operation, the pension of applicant, otherwise entitled thereto, shall be paid as in other cases." Each month applicants, for whom treatment has been recommended, are referred by the pension department to the department for prevention of blindness.

An example of what failure to treat applicants for the pension may mean in dollars and cents is the case of a man sixty-four years of age who was placed on the pension roll and received $1,800 from

the blind pension fund. A cataract operation for this man cost $18 at one of the operative clinics held by the department for prevention of blindness. His vision was restored and he was removed from the pension roll. What he had been paid for being blind would have provided eye care for forty-five patients at a cost of $40 per person, or this same amount would have been sufficient to pay the salary of another worker in the department for prevention of blindness for one year!

Home Work—Placement—Shops

The chief contribution of the department for prevention of blindness in relation to these departments is in securing and interpreting eye diagnoses and visual efficiency in order to place responsibility, from the standpoint of vision, among the various agencies working with the visually handicapped.

Co-operation with the Missouri School for the Blind

During field trips and at diagnostic eye clinics held throughout the state, blind and visually handicapped children are located who should be in school and are not known to the Missouri School for the Blind. Another service is rendered indirectly in helping to screen out partially sighted children who do not belong in a school for the blind, yet cannot get along profitably in the regular grade without sight-saving tools.

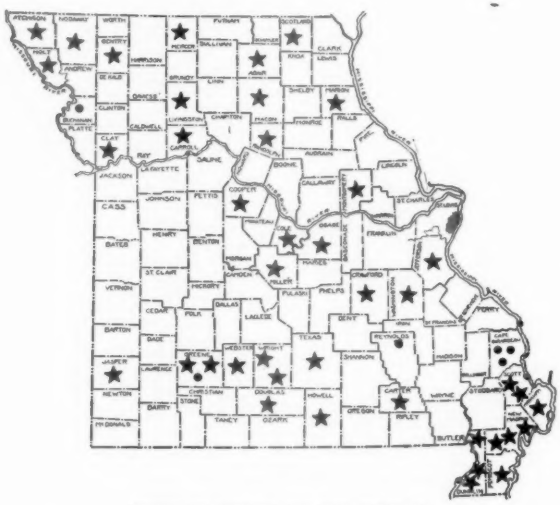
State-wide Participation and Motivation

The department for prevention of blindness has extended its activities beyond the co-operative relationship with the other departments in the Commission and has adopted a twofold program, remedial and educational in scope, involving either actual local participation throughout the state to prevent blindness and conserve sight, or acting as the motivating agency to promote greater efforts by existing groups.

Floating Eye Clinics

With few exceptions, the ophthalmologists in Missouri are grouped in St. Louis and Kansas City, and it follows that there are

large areas, sometimes including several counties, where there are no ophthalmologists, making it difficult for persons to secure examination and treatment. The floating clinics have been one means of making it possible for persons in need of eye care to be examined, and interesting results have been produced. Since January, 1929, forty-one of these clinics have been held throughout the state and over 3,900 persons examined, making an average attendance of 95 persons at each clinic.



EYE CLINICS IN MISSOURI
Stars—Diagnostic Clinics Circles—Operative Clinics

The clinics are always sponsored by one or more local organizations, and the following groups have promoted clinics: County Medical Societies, Parent-Teacher Associations, American Legion, Lions Clubs, Business and Professional Women's Clubs, Commercial Clubs, Rotary Clubs; and county officials—superintendents of schools, probate judges, health officers, and county nurses.

Pre-clinic publicity is directed by the groups sponsoring the clinic, jointly with the department for prevention of blindness, which furnishes the press releases. Notices of the clinic are sent to

each school teacher in the county, and to teachers in surrounding counties if another clinic is not contemplated soon in that section of the state.

The medical staff of the department for prevention of blindness consists of a medical director, associate medical director, and staff of fifty-seven ophthalmologists, no one of whom receives any compensation for his services. The medical director or associate medical director has charge of the clinics and is assisted by other members of the examining staff. The nurses in the department for prevention of blindness do the vision testing, secure history of the eye condition, and, after the person has been examined by the ophthalmologist, explain to him the result of the examination and recommendations for eye care. Social histories are taken and those persons unable to secure treatment are followed up later and arrangements made with local organizations for their care. In some cases a joint responsibility is assumed and in others the department for prevention of blindness may take the entire responsibility. The social plans which are made, obviously are modified to meet the local situations. The following conclusions have been reached in regard to floating clinics:

1. They provide competent eye examinations for persons living in districts far from an ophthalmologist.
2. Through the follow-up work after a clinic persons are treated who otherwise would not be cared for.
3. They are infinitely valuable from an educational standpoint, for they:
   a. Acquaint individuals with causes of blindness.
   b. Focus attention on the need of preventing blindness.

Medical Social Service

Realizing that while much has been accomplished in prevention of eye defects and resulting blindness, Utopia in this respect is still "fancy's child," one of the tasks at hand is to secure care for persons who are suffering from eye difficulties and are unable financially to secure competent medical care. Since the organization of the department for prevention of blindness, 436 persons have been treated. A serviceable plan has been worked out with the hospitals and clinics throughout the state. Reports of treatment are secured from the ophthalmologist who treats the patient and, as only in-

digent persons are cared for by the department for prevention of blindness, the physician gives his time without remuneration. Recommendations for future treatment are noted and follow-up memoranda maintained so that the patients will return for subsequent care and the value of treatment will not be lost.

The social service department of Washington University Clinics and Allied Hospitals has two full-time social workers in the eye clinic, and a plan has been worked out with the head worker in regard to patients coming to St. Louis for treatment. The head social worker on the eye service is notified by the department for prevention of blindness when a patient is to be admitted to the hospital and is given a report showing medical-social data pertinent to the patient's personal plan. While the patient is in the hospital he is visited by the social worker who keeps in touch with the department for prevention of blindness, notifies the department of his progress and the time for his discharge from the hospital, and sends a final report of treatment and recommendations for future care.

The department for prevention of blindness is responsible from this point on to see that recommendations are followed out and that the patient returns for care at the stated time. This applies only to patients living outside St. Louis, as the department for prevention of blindness does not work with patients in St. Louis, since there are other organizations to care for them.

If patients who live outside St. Louis report to the eye clinic and are unable to secure care for themselves, the social worker refers these persons to the department for prevention of blindness for follow-up, and if they are admitted to the hospital later by the department for prevention of blindness, the social worker keeps in touch with them as outlined above.

It is well to mention how the service may be reversed, the social worker in the eye clinic carrying the major responsibility and the Missouri Commission for the Blind acting in a specialized capacity. Individuals reporting to the clinic for regular care may be industrially blind and need employment or instruction in simple handicrafts and reading and writing raised types. The social worker plans with the representative of the Commission who supplies the specialized service for the rehabilitation of the patient.

Benefits accruing from such a plan are manifold:

1. The patient, who is the first consideration, is under sympathetic guidance from the time he is admitted to the hospital until treatment is completed, because the social worker and the worker in the department for prevention of blindness are planning together in the interest of the patient to remove obstacles which might prevent the full carrying out of treatment.
2. Less "shopping" is done by patients and valuable time saved, which in some cases may mean preventing loss of sight.
3. Social planning, either from standpoint of worker in the department for prevention of blindness or the medical-social worker in the eye clinic, is more efficient because of this reciprocal relationship.

Eye Surveys and Demonstrations of Vision Testing

One city and three county-wide surveys have been made of the vision of school children. In two counties the surveys stimulated the interest of the local groups and hastened the employment of county nurses. Enough children were located in the city-wide survey to bring to the attention of the Board of Education the need of a sight-saving class. In one county, of 1,158 children selected for examination by the school teachers, 135 were recommended for further examination by an ophthalmologist.

Since 1931 twenty-nine demonstrations of vision tests have been given. At the request of the Board of Education in a city with a population of 57,527, the department for prevention of blindness demonstrated vision testing to all the teachers in the school system, and vision testing was incorporated in the teacher's health education program. A demonstration of vision testing was given to the nurses taking the public health course at Washington University, as well as other nursing groups. The technique for vision testing advocated by the National Society for the Prevention of Blindness is followed, with the exception that the Snellen E chart is used for children of all ages and also for adults who are tested at the diagnostic clinics.

It is difficult to measure the results of this work, but in addition to getting early correction of visual defects, a number of children

are being located who should be in sight-saving classes or have the benefit of sight-saving tools. Over 200 have been found and the eye condition established. At the present time the department for prevention of blindness arranges examinations for these children, interprets the eye condition to the teacher and suggests sight-saving tools which can be secured at a small cost. The department for prevention of blindness feels that even more time should be given to vision testing demonstrations, especially in regard to the pre-school group.

Impetus was given to this work by the National Society for the Prevention of Blindness when the director of nursing activities was loaned to the Commission, before a department for prevention of blindness was established, and vision testing was demonstrated at the State Teachers Colleges at Warrenton, Maryville, Cape Girardeau, and Springfield; and the State Nurses Meeting in Springfield.

Research

Little more than a beginning has been made in the field of research. Diagnoses of all patients examined are tabulated each year. Cross-files are kept on all cases of congenital blindness and glaucoma.

Educational Program

The future effectiveness of the department for prevention of blindness is largely dependent on its educational program. In addition to what has been already outlined, speakers have been provided for talks before Parent-Teacher Associations and county teachers' meetings. During the Missouri Conference for Social Work in 1931, the department for prevention of blindness prepared a program on the contributions of various social agencies in prevention of blindness. Again in 1932, a luncheon meeting during the Missouri Conference for Social Work was given over to a program on sight conservation. Exhibits on prevention of blindness were placed at the State Fair, the State Nurses Meeting, the National Dairy Show, and in connection with the Week for the Blind.

A bulletin, *Out of Darkness with Proper Eye Care*, is published each month and sent to nurses, social workers, and various civic organizations. The following topics have been contributed by ophthalmologists on the staff:

Glaucoma, by Dr. Meyer Wiener.
Optic Atrophy in Missouri, by Dr. John Green.
Strabismus, A Curable Defect, by Dr. B. Y. Alvis.
Visually Handicapped Child, by Dr. H. D. Lamb.
Semi-Sighted Children in Public Schools, by Dr. W. L. Post.
Cataract, by Dr. Lawrence T. Post.
Eye Accidents, Prevention and Treatment, Dr. Roy E. Mason.
Spectacles, Their Use and Abuse, by Dr. M. H. Post.

Summary

The department for prevention of blindness has a duty to fulfill in relation to the other departments in the Missouri Commission for the Blind. It also has a distinct function to perform in carrying on a remedial and educational program throughout the state, either through local participation or acting as the motivating agency. As long as there are over 6,000 blind persons in Missouri and as many more potentially blind persons, these activities are necessary.

The public has become aware of the prevention and control of tuberculosis, diphtheria, and other diseases and it is necessary for the same enthusiasm to be stimulated in this field if vision is to be conserved and blindness prevented.

Preventing Ophthalmia Neonatorum in Virginia—An Administrative Problem

By W. A. Plecker, M.D.

NO important disease is more easily, surely, and inexpensively prevented in the vast majority of cases than ophthalmia neonatorum, says Dr. Plecker. The state bureau which has supervision of midwives aids greatly in this preventive program

NO DISEASE that is not often fatal is more productive of harm to the individual and of regret to the state than ophthalmia neonatorum, an infectious disease of the eyes of the newly born. No disease is more easily and surely prevented in the vast majority of cases than is this one by the simple instillation in each eye immediately after birth of a one per cent solution of nitrate of silver. A solution of this strength has been found as effective as the original two per cent solution advocated by Credé, and does not produce the reaction which frequently followed the stronger solution. In my experience as state registrar, in charge of the Bureau of Vital Statistics of Virginia which has the administration of the law for the prevention of blindness, I have found that no disease of equal importance can be as thoroughly and as inexpensively prevented.

The most virulent type of the disease, which usually appears at about three days after birth, is due to infection of the infant's eyes during birth by gonococci from the vaginal discharges of the mother. For the sake of preventing family discord and humiliation to the mother, the fact should be emphasized that only about two-thirds of the cases of opthalmia neonatorum are of gonorrheal origin. Other forms may be due to pneumococcus, streptococcus, staphylococcus, diplobacillus, and colon bacillus. These produce inflammation of a milder type and do not usually appear until

from five to seven days after birth, though it is possible for the infant to escape the primary infection from the vaginal canal through the use of the nitrate of silver and receive secondary infection by transmission of the mother's discharge by carelessness on the part of the nurse or the mother herself. The physician should determine the responsible infection by laboratory examination of the eye discharge.

Damage is produced by allowing the discharge to remain in contact with the surface of the eye; therefore, no disease demands more imperatively the most thorough and painstaking nursing that can be procured, which is, of course, in a hospital. The essential in treatment is the removal of the pus by gentle irrigation at half-hour intervals. If only one eye is involved, care should be used to protect the other from the pus, and from the irrigating fluid.

In the case reports which are called for by the Health Department and followed up closely by correspondence from our bureau, I am amazed at the inadequate treatment which a large percentage of the rural cases receive, and still further amazed that as many recover as do without serious damage. The supposition is that the cases are chiefly of non-gonorrheal origin. In one case, however, of a negro child, that was well advanced before a physician was called, the patient was so overwhelmed by the violence of the infection that death resulted, for the state probably a fortunate occurrence.

Of the cases that we have been able to follow up, nearly all occurred in the practice of negro midwives, who either did not use the eye drops or did it in an ineffective manner. One thought that the proper method was to rub the wax ampule containing the solution over the ball of the eye; another thought that the wax should be melted in a pan and rubbed on the eye, whether inside or outside the lids our informant did not say. Such cases of extreme ignorance are, of course, rare. Most of those who cannot read the instructions accompanying the ampules have learned by observing physicians and from the lectures of the midwife supervisor.

The midwives of Virginia are legally under the supervision of the state registrar, whose rule is never to write a private or an annual circular letter to them without closing with the admonition that no midwife is permitted to make an internal examination with her finger, and that every midwife is required to use the eye drops in

the eyes of the baby within five or ten minutes after birth, and to report the birth to the local registrar within ten days. I wish here to emphasize the second of these injunctions, as it is not generally realized even by physicians that an essential in using the prophylactic is to do it promptly. My instruction to the midwives is to do it before washing and dressing the baby, while it is suggested to the physicians that when the head is delivered and the body is delayed, they may even wipe around the eyes and use the drops while waiting for pains to recur and deliver the body. A delay of an hour or even of half an hour may be disastrous.

A word now as to the solution: I find that there is a tendency on the part of a number of physicians to use the various proprietary preparations of silver, upon the plea that they are as effective as the nitrate and less irritating. It is essential that these solutions be freshly made, a point which busy physicians are apt to neglect. Then, too, the proof that they are, even when fresh, as satisfactory as the nitrate of silver solution is not convincing. The clinching argument, however, is that if they have a mishap following the use of any preparation other than that recommended and furnished by the State Health Department, they have no adequate defense in case of a suit for damages, and cannot shift the responsibility back to the state.

Our bureau has systematically set aside dated samples of various lots of ampules, which we have several times had tested by the state chemist to determine the degree of deterioration. The solution keeps best in wax and poorest in clear bottles, especially when removed from the obstetrical satchel and exposed to the light. In wax little deterioration has been found after one year, with a loss of only about ten per cent in strength after two years. To avoid, therefore, furnishing physicians and midwives with more than a year's supply, monthly check sheets are kept by the clerk in charge of this work, showing the exact number of births reported monthly and yearly by each of the two thousand or more physicians and 4,300 midwives of the state. When they request ampules, their records are examined and a supply is sent for from six to twelve months only.

If a midwife asks for ampules in number greatly in excess of the births reported, we ask her why she is not reporting all of the births

for which she is using the ampules. On the other hand, if she asks for too few ampules, we are equally solicitous to learn why she is not using eye drops with all of her cases. Inquiry is tactfully made of physicians at times when the two records vary greatly, the suggestion usually being in the form of a reminder that it is safest to use the state preparation.

By this close supervision we believe that the ampules are well distributed and used.

A further check is the modification of the Virginia birth certificate, in which the questions are asked:

1. Did you use the eye drops?.....
2. If not, why?.....

As to the results: It is difficult for us to determine with any great degree of accuracy, but in 1929 Dr. Frank M. Hanger, ophthalmologist for the State School for the Deaf and Blind at Staunton, Virginia, wrote as follows:

"I have carefully gone over records at the Virginia School for the Deaf and Blind, and find that only two children have entered the school since the Taylor Law went into effect, on June 17, 1918, who were made blind as the result of ophthalmia neonatorum, and both of these were born prior to that date; consequently they had no prophylactic drops put in their eyes at birth.

"The Taylor Law has been in force for eleven years, and, thus far, has a clean bill of health. No child can enter the school until it is six years old, and not one has entered during the past five years. This record is indeed pleasing to those of us who are especially interested in this humane measure—an index to the efficiency of all those who are supposed to obey the law, as well as those whose duty it is to see that the law is properly enforced."

Dr. Hanger says further that he had seen but one case of ophthalmia neonatorum during the past ten years. By reference to the birth certificate for this child he refers to, we find that there was neither physician nor midwife in attendance at the birth and that the drops were not used. He reports also that during the thirteen years preceding the passage of the Taylor Law, twenty-four children blind from ophthalmia neonatorum were admitted to the Staunton school. This would indicate that there are now in Virginia twenty-two children at least, born during those eleven years, who can

see because of this law—who would otherwise have been doomed to lives of blindness.

The total appropriation for the administration of this law is $2,300, reduced from $2,500, which pays the salary of the clerk and the cost of postage, boxes, wrappers, and ampules, the latter being made in the laboratory of the State Health Department. The amount would not be sufficient, however, if the ampules were purchased of manufacturers.

I wish to suggest that no branch of health work is so well prepared for administering this law as is the Bureau of Vital Statistics, provided, of course, that the management is interested in preventive medicine, as well as in statistics, and makes use of the facilities available in the regular process of handling the birth certificates to advantage.

Editorials

Something to Think About

"THE National Society for the Prevention of Blindness doesn't surprise us, particularly, when it announces that 50,000 American school children today are handicapped by poor eyes; but when the announcement is made that only 4,000 of these are being given special attention, the figures should give everyone a shock of dismay and a realization that something should be done about it.

"The child troubled by defective vision is struggling under a terrific handicap, at the best. He may be called stupid, when his brain and ambitions are just as good as those of his fellows. But he cannot keep up to the others because he doesn't see as well as they.

"Perhaps the teacher sets down some figures on the blackboard. The average pupil will get the answer to the problem quickly; but not the boy or girl whose eyes are bad. When he or she is called upon for the solution, it isn't ready—because that child is still trying to make out the blurred figures. And the others, like as not, snicker at what they unknowingly call 'dumbness.'

"And there's another tragic feature in connection with this matter—the fact that the handicapped child, when he does awake to the realization he cannot see well enough, often does not mention this to his parents or teachers. He may even fear he's going blind, but the same kind of misunderstood, childish fear prevents his revealing what he thinks.

"Surely, this is a serious situation. The fourteen states now conducting special instruction and attention for youngsters with poor eyes are doing a splendid thing. But what about the other thirty-four?

"The matter certainly warrants serious consideration from all of them."

—*Tribune Republican*, Meadville, Pa.

Fourth of July Eye Accidents

As the day for celebrating the birthday of the nation approaches, it is of timely interest to consider the fruits of the slogan, "A Safe and Sane Fourth of July." Taking those figures which are of most interest to the National Society for the Prevention of Blindness, we find that from 1900 to 1916, in response to intensive safety campaigns, there was a great and steady decrease in the number of eyes lost because of Fourth of July activities. Although figures beyond 1916 are not available, we may assume that the decrease in eye accidents from Fourth of July celebrations has continued. Yet, in 1931, seventeen children lost the sight of one eye, and 141 children had accidents involving the eyes, because of the traditional celebration of this holiday. The Safe and Sane Fourth is still an ideal far short of attainment.

An increasing number of communities, both local and state, are prohibiting the sale of firecrackers and toy explosives. Safety organizations in other communities are agitating for the ban on firecrackers and allied dangers and are making headway in educating public opinion. Yet these agencies cannot prevent accidents among children whose parents are willing to have them take a chance. No other child is safe in a community where such danger still exists. The ultimate responsibility for the prevention of these accidents lies with the parent, as an individual and as a member of the community.

Now is the time for every mother and father to plan with their neighbors a celebration of Independence Day with a new tradition: an accident-less Fourth of July.

Note and Comment

Gun Seller Must Pay for Loss of Boy's Eye.—The law in New York City which prohibits the sale of air rifles to minors showed its teeth recently when the court awarded $12,500 to a thirteen-year-old boy whose eye was hit and destroyed in an air-rifle battle. The shopkeeper who sold the gun must pay heavily for his violation of the city ordinance. The court's decision comes as a timely warning, for closely allied to this ordinance is the prohibition of sale of fireworks and firecrackers to children under age. But, in the effort to prevent accidents of this type from occurring, the education must go beyond the seller and maker of such hazards to the parents, with whom the primary responsibility for enforcement of such prohibitions must rest. Ordinary living itself presents sufficient hazards to life, limb and senses, without inviting special and totally unnecessary risks in the form of guns and firecrackers.

Sight-Saving Class Training to Be Offered During the Summer Session of 1932.—Four universities and colleges are offering summer courses of training in co-operation with the National Society for the Prevention of Blindness. They are given in the order of the date of the opening of the session.

University of Cincinnati, Cincinnati, Ohio.—June 18–July 26, 1932. Registration June 18.

Teachers College, Columbia University, New York.—July 5–August 12, 1932. Registration must be made in person June 30, July 1 or 2.

State Teachers College, Buffalo, New York.—July 5–August 12, 1932. Registration July 5 and 6.

University College, University of Chicago, Chicago, Illinois.—June 27–August 5, 1932. Registration June 21 to June 25.

Ophthalmia Neonatorum Prize Paper.—The Robert Johnston Essay Prize, awarded under the auspices of the St. Louis Society for the Blind, was presented this year to Dr. Sidney A. Fox for his

paper on "The Methods for the Prevention of Ophthalmia Neonatorum; and Their Practical Value." This paper, tracing the history of ophthalmia neonatorum from its earliest recognition by Scranus, a Greek physician who lived during the second century A.D., to its treatment by Credé and the subsequent discoveries of its causal agents, stresses a fact which should be emphasized among the lay public—that ophthalmia neonatorum is caused in only one-third of the cases by the gonococcus. The knowledge that this eye disease, which has caused so much blindness in the past and continues to blind many whose sight might be easily saved, bears no moral stigma, will encourage the father and mother of every newborn baby to demand the protection of prophylactic treatment for their child.

Springfield, Massachusetts, Eliminates Eye Menace.—Needle-pointed, feathered darts, weapons of death among certain primitive tribes, have no place in the play of Springfield's children, according to that city's safety council manager; his activities have resulted in the enactment of a city ordinance prohibiting the sale of these dangerous toys which have recently caused several serious accidents among school children. Teachers, playground supervisors, police and parents are asked to co-operate in eliminating such unnecessary hazards from children's play.

The Family Doctor and the Squinting Child.—"Any squinting child has been neglected and probably irreparable damage has been done if he is allowed to arrive at school age without every effort having been made to ascertain and correct the cause of the squint," is the opinion of Dr. Frank P. Smart, in the *Virginia Medical Monthly*. The ability to learn fusion and acquire binocular vision is lost after the first six years of life, and any later correction will be outward only, without improving vision. It is the duty of the family physician to acquaint the parents of the squinting child with these facts and to see that the child comes early under medical care.

Pediatricians and Oculists.—In an editorial in the *American Journal of Ophthalmology*, Dr. Morie F. Weymann suggests a practical step in conserving the sight of children. He says, "As

many children today are under the care of pediatricians from infancy to above school age, and report to them periodically, there is no reason why, if the pediatrician is supplied with the proper charts, he cannot test the child's visual acuity at the age of four years or less. . . . Routine testing of school children's vision has prevented much ocular disability by the early discovery of ocular defects, but, with the co-operation of pediatricians, we can and should go one step further by detecting the more gross errors in children of the preschool age."

The belief that vision testing is an intrinsic part of the routine health examination of the preschool child has long been held by the National Society for the Prevention of Blindness. To facilitate the testing, a simple chart and testing game have been devised; these have been successfully used with children as young as three years of age. From a recent survey of centers where the materials and technique of vision testing have been demonstrated over a period of five years—public health groups, school nurses, parent-teacher preschool round-ups, preschool and kindergarten groups—it has been found that preschool vision tests have been incorporated in the health check-ups of some 1,300 groups.

The Ideal Book.—"What is the ideal book?" asks Edward K. Robinson in a recent issue of the *Publisher's Weekly*. He finds that it must be of a comfortable and convenient size to hold; its pages must be well proportioned to hold a type that is easily readable; for most books, twelve-point type (about the size of the type used in the SIGHT-SAVING REVIEW), with a four-inch line, will be most comfortable to read; spacing between lines must be unobtrusive, wide enough to avoid confusion, close enough to keep the text together. He recommends unglazed opaque paper, and the use of dark gray, rather than black, ink. Most of these points would be endorsed by those seeking to conserve sight, as well as by those whose considerations are more aesthetic.

Industrial Eye Injuries.—The recent rapid growth of industrial activity in the South has brought industrial eye injuries to the attention of Southern physicians in increasing numbers, according to an article by Dr. James B. Stanford in the April issue of the *New Orleans Medical and Surgical Journal*. Outlining briefly the

procedures for immediate treatment for eye injuries, he finds that ten per cent of blindness may be traced to industrial accidents, and that proper lighting and safety devices in mills and work shops would prevent at least half of the eye injuries.

Eye Defects in Childhood.—Dr. E. W. Kennedy, medical adviser of sight conservation, Department of Special Education in Rochester, N. Y., writing for the *School Physicians' Bulletin*, (April, 1932), points out that while ideally every school child should have the benefits of a thorough ophthalmic examination, where school medical systems fall short of this ideal, eye defects may be discovered through routine vision tests, examination for superficial physical signs, and the teacher's observation of reading habits, concentration and work attitude. While remedial efforts are vital, preventive measures are doubly so; prevention is largely a matter of education, extending backward to the parents before marriage, and throughout the growth of the child from prenatal life through school days. He concludes: "Glasses should not be looked upon as the sole solution, but prescribed only in connection with the study of the child's entire physical and mental status."

Home Lighting.—At the Home Lighting Institute, held at the headquarters of the Electrical Association of New York, lighting engineers pointed out that, despite the great progess in lighting during the past twenty years—the increased efficiency of light bulbs, the better design of light sources, and the scientific demonstrations of the relation between light and sight—illumination in the usual home is still only a little better than it was in the past. The effects of poor illumination tell upon every member of the family, and particularly upon the children. That proper lighting will improve seeing and eliminate eye fatigue, that it is an important measure of home safety and a large factor in the decorative scheme of the home, are axioms which must be emphasized to the home-maker.

Those mentors of the American standard of living, the women's magazines, are doing their share to make the American housewife light conscious. Some of the more recent articles that have appeared include:

"Lighting Makes Its Contribution." *Delineator*, January, 1932. A plan of lighting arrangements for a specific living room shows the value of light for eye comfort and for effective decoration.

"Good and Bad Lighting." *Ladies' Home Journal*, February, 1932. The same room, lighted properly and improperly; good lighting eliminates glare and harsh shadows and directs light where needed.

"The Well Lighted Home." *Parents' Magazine*, February, 1932. Conservation of sight, like charity, begins at home. Directions for insuring eye comfort and decorative beauty, as well as convenience, in lighting the home.

"Lights! Lights!" *Pictorial Review*, February, 1932. The three rules of home lighting are: (1) shade every light to avoid glare; (2) use enough light and avoid gloom; (3) provide light where it is needed.

"Light, Its Use and Abuse." *American Home*, May, 1932. Pictorial demonstrations of the wise use of light in various parts of the house.

Another point of particular note to home-makers, stressed in "Taking Care of Things," an article which appeared in the January, 1932, issue of the *Woman's Home Companion*, is the need to dust and clean light bulbs and light sources. The dust of two or three months may lower the output of light from a bulb by nearly 35 per cent.

Trachoma in Missouri.—From 1923 to 1930, a study of trachoma, its incidence, its effect upon sight, and its prevention, has been under way in Missouri. The assembled material, published in the April 15 issue of the *Public Health Reports*, is discussed by Dr. C. E. Rice and Dr. J. E. Smith. It has been found that in the southern section of Missouri, where the incidence of trachoma is greatest, the rate is almost 20 cases per 1,000, of whom one out of 26 is blind. Furthermore, of those not blind, one-eighth of the cases showed sufficient corneal involvement to reduce vision to 20/200 or worse. With the estimate of 17,000 active and inactive cases of trachoma in Missouri at the present time, the social and economic value of a wide program of treatment through clinics and hospitals and prevention through education is realized.

Silver Nitrate Used in California.—During March, the California Department of Public Health reports, nearly 1,400 outfits, consisting of two wax ampules containing a one-per-cent solution of silver nitrate, were distributed to physicians and midwives to be instilled in the eyes of newborn infants. These outfits are distributed free to physicians and midwives to encourage their use, although the state has no law demanding prophylaxis of the eyes of the newborn.

Poor Eyesight, A Problem in Mental Hygiene.—Unstable emotions and school failures may reflect an unsuspected visual defect, says Rose S. Hardwick, psychologist at the New England Home for Little Wanderers and at the Habit Clinics of the Massachusetts Division of Mental Hygiene, in an article in the April issue of *Understanding the Child*. Citing cases of children with school difficulties, she finds that the problem of adjustment was solved after correction of the eye defects. She concludes that (1) in all doubtful cases vision should be tested by competent specialists; (2) in every case it is of prime importance to create a favorable atmosphere for the child; (3) that the teacher is in a position to give first aid to these youngsters, and it is her patience, tact and resourcefulness which give effect to remedial treatment.

Another Cause of Reading Difficulty.—Although it is conceded that muscle balance and refractive errors most frequently cause reading difficulties, a recently recognized physiological disturbance —undetermined dominance of the brain hemispheres—may be the cause of poor reading and writing. An article by Mrs. Gladys E. Hosmer in the March *Hygeia* tells the story of a child, intelligent, adjusted and normal-sighted, who was unable to read. The discovery of his handicap led to training which recognized and accepted his confusion of images; reading, however, will always remain a process of mental translation of the image he sees to the one generally accepted.

Ophthalmology at Law.—Dr. Sydney Walker of Chicago defines briefly in the *American Journal of Ophthalmology*, for March, the legal phases of industrial ophthalmology. Discussing some of the specific problems encountered by the testifying ophthalmologist,

he emphasizes the need for accuracy and completeness of records, the differentiation between results of injury and pre-existing conditions, and the importance, to both the employee and the employer, of simple and direct testimony.

Prohibition on Fireworks Upheld in Maryland.—Rallying to the defense of the Maryland statute which prohibits the sale of fireworks, the Maryland Society for the Prevention of Blindness, with the co-operation of the Public School Association, the League of Women Voters, the Civic League, the Safety Council, the Fire Board and the Police Department, showed why any amendment to the present statute would be dangerous. The most moving of the arguments was the mute and pitiful testimony of a three-year-old girl who was severely burned last Fourth of July by the so-called harmless sparkler. The full prohibition of the sale of fireworks will be maintained in Maryland.

Prompt Treatment Needed in Ophthalmia Neonatorum.—Because an unusually large number of cases of ophthalmia neonatorum have been reported to the New York State Commission for the Blind, the Commission reiterates the need for immediate care of all cases of babies' sore eyes. Prompt hospitalization of the child, maintenance of breast feeding, isolation until two smears are negative for gonorrhea, and prompt notification of all cases, whatever their origin, are of prime importance in saving sight from this devastating disease.

The Commission reminds physicians and health officers that lack of funds is no reason for delay of treatment, since the establishment of the Commission's revolving fund finances the immediate care of ophthalmia neonatorum cases pending the obtaining of local funds.

Contact Glasses.—Although contact glasses were invented over two hundred years ago, it has been only within the past ten years that the difficulties of fitting, making and wearing them could be overcome. In spite of their great success in some cases, says Dr. H. C. Neblett, in *Southern Medicine and Surgery* for April, 1932, their use is still confined to a relatively narrow field. Their high cost, their fragility, and the difficulty that many people experience

in wearing them, will necessarily restrict their use at present and for some time in the future to actors and others who, needing glasses, do not wish to mar their appearance.

Looking Backward in Ophthalmology.—Because ophthalmology, as a specific branch of medicine, is comparatively young, many of its greatest figures are still green in memory. In "Reminiscences of Forty Years in Ophthalmology," published in the *Pennsylvania Medical Journal* for April, Dr. William C. Posey discusses informally the contributions and characteristics of some of the great eye surgeons of yesterday. The presentation is such as to make layman and scientist alike share Dr. Posey's enthusiasm for these men and for their share in saving sight.

Glasgow Clinics Study Visual Acuity.—From records of visual acuity, taken before and after correction in the Glasgow clinics for correction of defective eyesight, it has been noted that, before correction, 36 per cent of the group had good or fair visual acuity; after correction, this percentage rose to 85 per cent with good or fair vision, while the 63 per cent with bad vision before correction fell to 15 per cent after glasses had been supplied. The educational value of supplying 85 per cent of a class with good eyesight cannot be overestimated.

Sight-Saving Classes in New York State.—A publication of interest to teachers, superintendents and educators is the April 15 issue of the *University of the State of New York Bulletin*, which is devoted to a description of sight-saving classes in New York State. Miss Matie M. Carter, state supervisor of sight-saving classes, has combined a general outline of the work and aims of all sight-saving classes with the specific details of the requirements of the State of New York. Because of its clarity, simplicity and forcefulness, this booklet should be valuable propaganda among educational and lay groups.

Preventing Ophthalmia Neonatorum—A Constitutional Infringement?—An editorial in the March, 1932, issue of the *Illinois Law Review* examines the facts regarding the ophthalmia neonatorum bill which failed to become a law in Illinois last summer, because of its alleged unconstitutionality. The writers, Kenneth C. Sears

and Arthur H. Kent, find that the measure is conducive to human well-being; that the procedure recommended is endorsed by various reliable health authorities; that its enforcement in other states has prevented blindness and saved large sums of money. Reviewing decisions of the Supreme Court of the United States on similar measures, the writers conclude: "If the state may penalize the failure to inject a vaccine virus into the blood stream of a human being; if the state may prevent by penalty the marriage of epileptics; if the state over objection may cause to be performed an operation upon a female which involves cutting through the abdominal wall in order to prevent procreation by a feeble-minded person, then it seems to approach the ridiculous to hold that a state, within the constitutional concept of liberty, cannot prevent a loss of vision by dropping into the eyes of an infant within an hour after birth a solution which at most will cause only a temporary irritation."

Daylight in Offices.—How much daylight is needed in offices? In England, according to the Illumination Research Bulletin No. 12, a study, undertaken by E. K. Taylor to determine the amount of natural daylight needed in offices for the visual requirements of workers, defines the "no sky line," a point in the interior from which the sky cannot be seen, as the point beyond which visual work is not possible. One foot-candle of illumination, not less than 2/1000's of the complete illumination of a horizontal surface under an unobstructed sky, is the minimum daylight illumination for an office. This investigation corroborates the finding that light-colored walls and ceiling tend to increase the illumination values.

More Sight-Saving Classes Needed in New York.—In his annual report, Dr. William J. O'Shea, superintendent of schools in New York City, says that while the sight-saving classes now established in New York have made a marked contribution in providing opportunities for handicapped children, there is not a sufficient number of these classes to which an increasing number of oculists are recommending children. He also urges the establishment of treatment centers for children having inflammatory conditions, when the parents cannot afford the care of a physician.

International Prevention of Blindness Report.—The report of the annual meeting of the board of governors of the International Association for Prevention of Blindness, published originally in French, has recently been released in English translation. Of particular interest are the report of the president, Prof. de Lapersonne, of the year's progress, and the papers, "Present Legislation and Protective Measures Against Eye Hazards in Industry," by Dr. Coutela; "The Value of a Complete Investigation of the Causes of Blindness as a First Step in Prevention," by Dr. Cridland; and "Cataract in Fresh Water Fish as a Result of Parasitic Invasion of the Crystalline Lens," by Dr. Park Lewis. Copies of the report may be obtained from the National Society for the Prevention of Blindness, at 450 Seventh Avenue, New York, N. Y., or from the International Association for Prevention of Blindness, 66, Boulevard St. Michel, Paris, France.

Certification of the Blind in Scotland.—A shifting of the statistical duties in the registration of the blind from a central bureau to local authorities has been made in Scotland. Latest reports show an increase in blind persons over fifty years of age, with a slight decrease in the number of blind children. The law, which demands an ophthalmic certification of blind persons, has a direct bearing upon the prevention of blindness, since experience has shown that many who have been considered blind are so through lack of medical care. Recommendations for operations or for medical treatment have led to the restoration of sight of many applicants for certification.

Accidents Chief Cause of Blindness in Wisconsin.—Industrial hazards and accidents to children at play are now the chief causes of blindness in Wisconsin, according to a note in the *United States Daily* by Dr. G. W. Henika, assistant health officer of Wisconsin. Blindness from ophthalmia neonatorum has been practically eliminated in the twenty years of enforcement of the prophylactic law. Prevention of industrial accidents and forethought in supervising children's play should further reduce the toll of eye accidents.

Miguel de Mérida Nicolich.—Word has been received of the untimely death of Dr. Mérida Nicolich, director of the Institute for

the Blind at Málaga and an indefatigable worker for the blind in Spain. It was the privilege of the staff members of the National Society for the Prevention of Blindness to learn to know Dr. Nicolich and to hear of his work, during his attendance at the World Conference on Work for the Blind.

National Society Notes.—The widest audience ever to be reached at one time by the National Society for the Prevention of Blindness listened to a brief talk on sight conservation when Mr. Lewis H. Carris, managing director, spoke during the *Literary Digest* radio program directed by Lowell Thomas. This was arranged following the publication of a full-page story on the need for sight-saving classes, which appeared in the *Literary Digest* of April 9. As a result, a number of inquiries on the various aspects of sight conservation have already reached the National Society.

The wide interest in sight conservation has been amply demonstrated by the reception given Mrs. Winifred Hathaway, associate director of the National Society, on her visit to the Hawaiian Islands; during her six-week stay there, she spoke before sixty-one meetings, including parent-teacher associations, teachers' meetings, women's clubs, classes at the University of Hawaii and high school students. Demonstrations of vision testing for all school groups, school lighting surveys and individual conferences pointed the way to a constructive program of sight conservation in the Territory. A similarly enthusiastic welcome marked Mrs. Hathaway's stop-overs along the West Coast on her eastward journey. She visited San Francisco, Portland, Seattle, Tacoma, and, later, Denver and Omaha, in the interests of sight-saving classes located in those cities.

Because facilities for the special training of medical social workers in eye clinics will be increased this year, Miss Eleanor P. Brown, secretary of the National Society, has been visiting medical centers and university hospitals in eight states and the District of Columbia, to determine the number of qualified applicants for the coming term.

On the invitation of public health officials of six states, Miss Mary Emma Smith, R.N., director of nursing activities of the National Society for the Prevention of Blindness, addressed 25 groups

of nurses, parent-teacher associations, teachers and others interested in the conservation of vision, on the practical value and simple method of testing the vision of the preschool child. Miss Smith visited centers in West Virginia, Maryland, Tennessee, Arkansas, Texas and New Mexico; during her stay in San Antonio, Texas, she demonstrated preschool vision testing at the Biennial Nursing Convention.

The National Conference of Social Work, held in Philadelphia, Pa., May 15 to 21, was attended by several staff members of the National Society. Mr. Lewis H. Carris contributed to a symposium on "How Best to Unite Forces for the Handicapped." At the joint luncheon meeting of the American Association of Hospital Social Workers and the National Society for the Prevention of Blindness, Miss Eleanor P. Brown spoke on "The Eye Clinic Social Worker and the Community." Others participating in the Conference were: Miss Mary Emma Smith; Miss Alice M. Bradford, membership secretary; and Mr. David Resnick, director of publicity. Throughout the Conference, the National Society maintained consultation service and an exhibit in the main hall.

"Bright Eyes for May Day," by Miss Isobel Janowich, editor of the National Society, was the first of a series of radio talks given at the invitation of the New York Tuberculosis and Health Association. The subsequent talks, all occurring during May, were: "Eyesight in Summer," by Mrs. Dorothy Crane Vaughan, staff assistant; "Bright Eyes for School," by Miss Mary Emma Smith, R.N.; "Sight-Saving in the Home," by Mr. David Resnick; and "Eye Hazards in Play," by Miss C. Edith Kerby, statistician.

Current Articles of Interest

Detachment of the Retina and Its Surgical Therapy, Leo L. Mayer, M.D., *Archives of Ophthalmology*, April, 1932, published monthly by the American Medical Association, Chicago, Ill. From a study of artificial detachment of the retina, it was noted that methods which do not cause destruction of the tissue such as is found in cautery, but at the same time produce an exudate that seals the retina to the choroid, would seem to be those of preference.

Management of Heterophoria, C. D. Townes, M.D., *Kentucky Medical Journal*, January, 1932, published monthly by the Kentucky State Medical Association, Lexington, Ky. In treating cases of heterophoria, detailed study and routine muscle tests should be made, without and with proposed correction. Detection of the abnormal muscle usually results in cure without operation.

The General Significance of Visual Tests, Edward Jackson, M.D., *Canadian Medical Association Journal*, April, 1932, published monthly by the Canadian Medical Association, Montreal, Canada. Tracing the development and scope of visual tests—for acuity, for field, and for color—the writer finds that vision reflects and affects bodily conditions as a whole; its relationship to general health must make it of significance to the general practitioner and to the medical specialist in fields other than ophthalmology.

The Problem of Late Afternoon Lighting, C. E. Ferree and G. Rand, *Archives of Ophthalmology*, April, 1932, published monthly by the American Medical Association, Chicago, Ill. That illumination for late afternoon is poor because of the mixture of natural and artificial light has been disproved. The writers find, however, that greater intensity of artificial light must be used to supplement failing afternoon daylight, to bridge the period between the high illumination of noon and the full use of artificial light. When carefully corrected for color and composition, artificial light may be so utilized as to make the change unnoticeable.

Ocular Onchocercosis, Rafael Silva, M.D., *Southern Medical Journal*, February, 1932, published monthly by the Southern Medical Association, Birmingham, Ala. Describing the parasite of ocular onchocercosis, a recently recognized eye disease, the author tells the history of the efforts to combat this cause of certain blindness. Extirpation of cysts does not remove the filariae from the other parts of the body; substitution of plasmochin solution for aqueous humor destroys the parasites in the eye and prevents blindness. The tendency of the parasite to move to illuminated areas and to shun the dark accounts for the fact that it is found in superficial skin areas and in the conjunctiva of the eye. Hope is entertained that these isolated discoveries about the filaria of onchocercosis will lead to general prophylactic measures against it.

An Unusual General Condition with First Symptoms Appearing in the Eye, Charles K. Beck, M.D., *Kentucky Medical Journal*, January, 1932, published monthly by the Kentucky State Medical Association, Lexington, Ky. Report of a case in which a child, eight years old, presented severe headaches and increasing ocular hemorrhage. Treatment for lues was instituted, followed by search for brain tumor; death came after a year's study, and neither the eyeball nor the body gave a clue to the cause of the eye condition or the death.

Workmen's Compensation Problems, V. A. Zimmer, *Archives of Ophthalmology*, March, 1932, published monthly by the American Medical Association, Chicago, Ill. The director of the Division of Workmen's Compensation, Department of Labor, State of New York, interprets to ophthalmologists the importance of careful study and detailed reports in all eye injuries to workmen. The relatively large number of eye accidents and their potential seriousness make the ophthalmic studies in compensation of prime importance to employee, employer and the State.

The Barraquer Operation for the Removal of Senile Cataract, William J. Harrison, M.D., *American Journal of Ophthalmology*, February, 1932, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. Nine months spent under the instruction of Professor Barraquer of Barcelona, Spain, gives the writer au-

thority for his detailed description of the Barraquer technique for the removal of cataract. He concludes: the Barraquer suction operation is a definite aid to the successful removal of cataract, with the additional advantages of shortened convalescence, total absence of potential inflammatory lens and capsule remains, and good visual acuity.

How to Protect Your Eyesight, *Everybody's Health*, March, 1932, published monthly by the Minnesota Public Health Association, St. Paul, Minn. In the new editorial department, Health Lessons for Schools, eyesight conservation is explained by charts, diagrams and a text which makes clear the physiology of the eye, the common defects of vision, the care of the eyes and the prevention of eye accidents. Suggestions for teachers and references round out this lesson in sight conservation.

Relation Between Ocular Tension and General Blood Pressure, Raúl Arturo Chavira, M.D., *Anales de la Sociedad Mexicana de Oftalmologia y Oto-rino-laringologia*, October-November-December, 1931, published quarterly by the Mexican Society of Ophthalmology and Oto-rhino-laringology, Mexico City, Mexico. After a study of 260 cases, adolescent and adult, with normal and abnormal ocular and arterial tension, the writer finds that there exists no constant and fixed relation between ocular tension (which is often higher in adolescents than in adults), and general blood pressure.

Ways in Which Distance of the Test Field Affects Determinations of Retinal Sensitivity, C. E. Ferree and G. Rand, *Archives of Ophthalmology*, March, 1932, published monthly by the American Medical Association, Chicago, Ill. From studies of intensity of light from varying distances, the authors find that distance is a factor in the determination of retinal responses, and should be given consideration in determination of sensitivity at the center of the field and in work on the perimeter and the tangent screen.

Workshop Lighting, E. L. Oughton, *Industrial Welfare and Personnel Management*, March, 1932, published monthly by the Industrial Welfare Society (Inc.), London. The amount of light needed in the factory is governed by the type of work done, the

type and size of the machines, and the color of the walls and ceilings. For a plant in use both day and night, efficiency demands that the artificial night illumination match that of the natural daylight.

A New Device for Training and Testing Binocular Vision, T. H. Whittington, M.D., *The British Journal of Ophthalmology*, February, 1932, published monthly by the British Journal of Ophthalmology, Ltd., London. The difficulties of treating strabismus by usual fusion-training methods often result in the abandonment of the prescribed exercises. A technique of more interest to the child, and one showing more objective results, involves the use of a wax drawing tablet, adapted to the usual stereoscope for fusion training.

Prognosis of Certain Eye Injuries, Elbert S. Sherman, M.D., *Archives of Ophthalmology*, March, 1932, published monthly by the American Medical Association, Chicago, Ill. The large percentage of eye accidents that are sustained in industry makes necessary an accurate prognosis of future vision. This paper discusses in detail the probable outcome of penetrating wounds of the eye caused by flying particles.

Trachoma, Charles S. Alexander, M.D., *Texas State Journal of Medicine*, April, 1932, published monthly by the State Medical Association of Texas, Fort Worth, Texas. A short article describes the history of the search for the cause of trachoma, its outstanding diagnostic features, and the accepted treatments for this eye disease which may quickly affect a wide population.

Studies in Ocular Fatigue: III, Fatigue of Accommodation, Conrad Berens, M.D., and Elizabeth K. Stark, *American Journal of Ophthalmology*, March, 1932, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. Although fatigue of accommodation has been recognized since Donders' work in 1864, until recently no objective scientific study was made of it. The ergograph, first adapted to the study of accommodation fatigue by Howe, was improved to provide accurate control of rest periods, rate of approach and recession of the test object, constant illumination, and simplification of the mechanical work of the subject. This improved ergograph is fully described and illustrated.

Book Reviews

ACCIDENTAL INJURIES. Henry H. Kessler, M.D. Philadelphia: Lea and Febiger, 1931. 718 p. Ill.

This work appears to be one carefully planned and admirably executed from the standpoint of the general surgeon. The importance of accidents and injuries has increased with the extension of indemnities to include almost all departments of industry. The contents include a historical review of the subject with a consideration of the duty of the employer, a summary of the various liability laws and their classification, the administration of compensation laws, the rehabilitation of the industrially disabled, occupational diseases, the basis of schedules, and the pathology of trauma with the end results. Injuries involving the extremities, the spine, the thorax and the abdomen are all adequately considered.

Injuries involving the eye, however, are far less satisfactorily treated. About 4 per cent of all injuries involve sight, but this by no means measures their importance because the indemnities paid are much nearer 10 per cent of the whole, and the importance of vision is so preponderating that it always demands the most careful consideration in every case brought up for investigation. On that proportional basis it would be not too much to have devoted at least 70 pages to the consideration of injuries of the eye alone. As a matter of fact, including the bibliography, the whole subject is considered in less than 14 pages. Of this, eye injuries in relation to pre-existing disease, the schedule of awards for eye disabilities and the evaluation which is reviewed of the work of the Committee on Compensation of the American Medical Association, occupy about 12. Another page is taken with a list of conditions that may result from skull injuries alone.

The original paper by Dr. Joseph F. Somberg, constituting Bulletin No. 10, from Bureau of Workmen's Compensation of the State of New York, Department of Labor, is an excellent review of the subject, but the mere list, as taken from it, is inadequate and incomplete without the explanations and discussions that should be in-

cluded. That leaves only a single page for original description of eye injuries which is so inadequate and incomplete as to make it practically of little value either to the general physician or to the specialist. It is a pity that so good a book should not have had the part devoted to the eye either written or revised by a practical ophthalmologist, because no matter how competent or experienced a general surgeon may be, in so distinctive a specialty as that of the eye he can hardly be expected to add material of intrinsic value. The book is well printed on good paper, excellently illustrated and ought to be of great value in the field for which it is designed.

PARK LEWIS, M.D.

SCHOOL NURSING, A Contribution to Health Education. Mary Ella Chayer, R.N. New York: G. P. Putnam's Sons, 1931. 292 p.

Miss Chayer's book itself is a real contribution to health education. To many school administrators, as well as to some nurses, it will offer a new conception of what a properly prepared nurse may do for the health of school children. The discussion of the historical development of school nursing will clarify for those not versed in the history of public health nursing, many of the apparent inconsistencies and contradictions often observed in school nursing services as they are established in various places.

To administrators, no chapter will be found more valuable than the one on the principles of education as applied to the school nurse. To a nurse entering school work this supplies an invaluable point of view and will stimulate her to a much richer program.

All through the book Miss Chayer's emphasis is put on the positive and constructive possibilities in the nurse's school work. Too many people see for her only the patchwork on damages already done, only opportunities to take care of pupils who are suffering from one thing and another, with little or no service to the well children, and with no time or attention for the eradication of the conditions which have produced the difficulties.

The author's plan of development of each special topic seems to be to begin with a discussion of all preventive measures and a placing upon the nurse of a direct responsibility to see that her school gives proper consideration to these factors.

Incorporation of material from such organizations as the Na-

tional Organization for Public Health Nursing, the National Society for the Prevention of Blindness and the National Congress of Parents and Teachers, increases the value of the book for use in courses preparing nurses for school work as it is a most effective indication of the incorporation the nurse should make of such material in her own work.

A consideration of the information and principles presented should secure for school nursing a greater appreciation on the part of nurses planning to enter school work of the necessity for better professional preparation than has often been considered necessary; an appreciation on the part of school authorities of the value of a much greater amount of nursing service than is now demanded in many schools; and a recognition on the part of administrators of general public health programs, of the often overlooked opportunities school nursing work has to offer for the functioning of many parts of the public health program now being attempted through much less effective means.

MARIE SWANSON, R.N.

DISEASES AND INJURIES OF THE EYE. William George Sym, M.D., F.R.C.S.E. Third Edition. London: A. and C. Black, Ltd., 1930. 493 p.

This is the third edition of Doctor Sym's volume for the student and practitioner. As the first edition was published in 1913 the work has survived most of its contemporaries.

Following preliminary chapters on General Examination of the Eye and Refraction, the various anatomical parts, beginning with lids and proceeding to the optic nerve, are discussed in order. Separate chapters are devoted to glaucoma, the ocular muscles, strabismus, the lacrimal apparatus, and orbit, followed by chapters on wounds and injuries and medico-legal questions. Points in general diagnosis, eye symptoms in diseases of other parts and points in nursing conclude the didactic chapters. There follows a discussion of therapeutic agents and a list of requirements for public service. The volume is indexed. Twenty-four full-page illustrations, fifteen of them in color, are supplemented by eighty-eight text figures.

That it has survived for thirteen years indicates its value, al-

though, in common with most volumes of its aim and scope, it is directed between the student and practitioner on the one hand, and the ophthalmologist on the other, and should serve its most useful purpose in aiding the former to understand if not to become the latter. Many of the minutiæ of cataract surgery have no particular place in a volume for the practitioner, and yet a 1930 publication for the ophthalmologist which neglected the more recent advances in this field would hardly be justified.

The book holds interest for the American student of ophthalmology primarily because of the refreshment which comes from a slightly different point of view. It is pleasant to read occasionally something of the historical background which supplies interest in and appreciation of the subject being studied. Doctor Sym has made somewhat more effort to achieve this than most authors of similar sized books.

The discussion of Perimetry is rather discouraging in its technical aspects,—all the more so as it is immediately followed by an appreciation of Bjerrum's contributions to quantitative scotometry. We can hardly be expected to make progress in this important part of functional testing of the eye as long as students are taught casual 10/300 field testing with no further mention of the important external factors which influence their results.

The American student will be helped by the notes on bacteriology, especially of the conjunctiva, with their simple, direct instructions and illustrations. He will miss among the color tests the names of Ishihara and Stillings, both popular in this country. He will be suspicious, and rightly so, of the suggestion that no dressing be applied after a cataract extraction. The logic and practical advantages of this procedure will require demonstration in America by ophthalmologists of considerable standing, and we have few of them willing to undertake the experiment. For his courage, the author has our respect.

Other mild surprises for the reader of American medical literature will be found in the chapters on the choroid and retina. The words *strumous* and *diathesis* are passing out of our writings, although it is by no means certain they will not be recalled. "Diabetic" and "albuminuric" retinitis are treated in the conventional manner. They, too, are passing out of our writings and it is becom-

ing more and more certain they will never be recalled. Surgical treatment of detachment of the retina, a major ophthalmological issue on two continents, receives no support in this volume. Nor does orthoptic training or any of the surgical procedures designed to straighten an eye, except tenotomy or advancement. Cycloplegia and occlusion of the master eye are advocated, as is the wearing of lenses. Worth's amblyoscope is mentioned only to be discarded as valueless. Recession and resection are not mentioned. This will surprise many Americans who have become so thoroughly converted to these procedures and who have, as well, looked to London as the source of most of the orthoptic devices intended to correct muscle imbalances by fusion training.

LE GRAND H. HARDY, M.D.

SPECIAL EDUCATION—THE HANDICAPPED AND THE GIFTED. A Publication of the White House Conference. New York: The Century Company, 1931. 604 p.

In view of the fact that readers of the SIGHT-SAVING REVIEW probably will be most interested in the chapter on The Partially Seeing, the reviewer is limiting her comments particularly to that section of the book. What a feeling of satisfaction the reader of this report gains when he finds that although the titles, The Blind and The Partially Seeing, are grouped together, each one is given a separate place for discussion in the book.

In giving special attention to this chapter, it is evident that an exceptional piece of work has been done. The graphs and various charts give us splendid pictures of this specific problem in the United States. They compare different communities in the development of the work, give us a clear understanding of the distribution of the various eye difficulties and also mention the states making legal provision for establishing and financing special classes. They very definitely show us that, so far, the surface has only been scratched in the establishment of sight-saving classes. Many more of these classes are needed before we can feel that this type of handicapped child is adequately cared for.

The committee did not emphasize too strongly the importance of choosing a properly qualified teacher for a sight-saving class. She should not be picked because there is no other place for her in the

school system, but her educational and personal qualifications should be made the criterion.

Particular care should be taken in placing a child with more than one handicap, so that the greater is receiving the educational benefits. For instance, a child who is definitely subnormal does not belong in a sight-saving class. A lack of intelligence is a greater handicap than an eye difficulty. However, when there is a question about the two, it is best to give the child a trial in a sight-saving class. It has been proven that apparent mental slowness has been due, in large part, to the fact that the child has been unable properly to visualize his surroundings.

Throughout, the report has the merit of completeness. After reading it, school authorities will strongly endorse the need of medical service for all children and the establishment of classes for the education of the handicapped ones. Certainly in a few years, many classes will be established in the rural sections as well as in the cities, thus giving to every child an equal opportunity for preparation for life.

MATIE M. CARTER.

Briefer Comment

THE ELECTRIC LIGHT AND POWER INDUSTRY IN THE UNITED STATES. New York: The National Electric Light Association, 1931. 188 p. Ill.

In a survey of the origin, development, general organization and practical workings of the electric light and power utilities serving the United States, the section on "Lighting" is of particular interest to those concerned with the conservation of vision. Showing the relation between light and sight, this chapter demonstrates how to avoid glare and shadows in lighting, and how lighting may be utilized to the greatest benefit in school, office, industry and the home. A short section is devoted to efficient street lighting. The illustrations are clear and instructive, showing concretely how light is used for maximum efficiency.

SUGGESTIONS FOR THREE COMMUNITY STUDIES. Prepared by the White House Conference on Child Health and Protection. New

York: Office of Public Relations, American Child Health Association, 1931. 42 p.

Summarizing three of the projects of the White House Conference on Child Health and Protection, Public Health Service and Administration, Education and Training, and the Handicapped Child, this pamphlet suggests through outlines, bibliographies and reference agency lists how small communities may develop and bring into being the spirit of the Children's Charter; work sheets and questionnaires make the projects concretely applicable to each community.

MANUSCRIPT WRITING LESSONS, BOOK III. Stone and Smalley. New York: Charles Scribner's Sons, 1931. 46 p.

The growing interest in manuscript writing, not only among sight-saving class children, but as a more direct co-ordination between the symbols of reading and writing for all children, has encouraged the publication of this third booklet of writing lessons. In its small pages are found suggestions for practice; teachers of sight-saving classes will find it particularly useful.

REPORT OF THE CERTIFICATION OF BLINDNESS; AND THE ASCERTAINMENT OF THE CAUSES OF BLINDNESS. London: The Prevention of Blindness Committee of the Union of Counties Associations for the Blind, 1931. 24 p.

There has arisen in Scotland, England and America a simultaneous realization of the fundamental need of a uniform certification of the blind. In this report by the Committee for the Prevention of Blindness of the Union of Counties Associations for the Blind of England and Wales, the relationship between the prevention of blindness and an accurate knowledge of types of eye defects causing blindness is brought out. The Committee, having reviewed historically the progress of blind certification in England and Wales, urges the adoption of the Glasgow scheme for the certification of blind persons: the examination of all blind persons now on the register by two skilled ophthalmologists whose records shall state the initial eye defect and its cause, the treatment pursued or recommended, and the educational and economic possibilities for the patient. An appendix shows the proposed forms for complete, uniform and reliable information on blindness.

THE ETIOLOGY OF CHRONIC UVEITIS. Proceedings of the Association for Research in Ophthalmology. St. Louis: Ophthalmic Publishing Company, 1931. 93 p. Ill.

Since study of causal factors in a disease is a prerequisite in determining preventive methods, this symposium by eight ophthalmologists, authorities in the field, has a pertinent bearing on prevention of blindness. Following a review of the literature of chronic uveitis, papers discuss the infections of the upper respiratory tract in the etiology of chronic uveitis, elective localization in determining the etiology, considerations underlying the experimental production of the disease, its relation to tuberculosis, endogenous infections in the etiology of chronic iritis, and a study of syphilis as a cause of chronic uveitis. The full discussion following each paper is an added factor in the completeness of the report.

REPORT OF THE COMMITTEE OF INQUIRY INTO PROBLEMS CONNECTED WITH DEFECTIVE VISION IN SCHOOL CHILDREN. Board of Education. London: His Majesty's Stationery Office, 1931. 54 p.

The Committee has sought to "inquire into the factors in childhood leading to the development of squint and defective vision . . . to obtain more exact data than are at present available in regard to unselected children of various ages and to ascertain more precisely what changes occur and of what quality from age to age."

From the nature of the problem, this could be but a preliminary study of the status of vision among school children. The report shows: the rarity of the "normal" eye in childhood; the rarity of myopia in early childhood and its subsequent increase with school age; the large number of cases of hypermetropia among young children and its decrease with the school age. The Committee recommends that a vision test be given routinely to all children and that, ideally, this should be part of a complete ophthalmic examination; that the present vision standards for children be revised to take into account the natural amount of hypermetropia normal to the age, so that a child who now registers emmetropic may be truly recognized as a potential myope; that the tests be given to younger children who have a greater chance for correction than those of the letter-reading age. Further study of these questions is urged for the establishment of a basic scale of vision for childhood.

SIXTH ANNUAL REPORT OF THE FRONTIER NURSING SERVICE. Lexington: The Quarterly Bulletin of the Frontier Nursing Service, Summer, 1931. 84 p.

Although the work of the Frontier Nursing Service is of wide scope, offering not only the physical aid of a medical center but the help of friendly advice and social service, many of its activities are part of a prevention of blindness program. Care of expectant mothers prevents the development of syphilis in babies; medical and nursing attention at birth prevent ophthalmia neonatorum; supervision of hygiene, instruction in proper nutrition and actual aid in growing vegetables are valued services toward preventing blindness. More directly, an eye clinic is maintained and the eyes of adults and school children receive any needed corrections.

As a service to rural sections and as a demonstration of possible organization in other sections, the Frontier Nursing Service is receiving merited recognition.

A BRIGHT BOOK OF LIGHTS. Helen Benton Minnich. New York: Frederick A. Stokes Company, 1931. 64 p. Ill.

This small book, tracing with simple text and illustrations the development of light from its original source of sun and fire through the modern lights of city streets, is especially to be commended for its clear print, which makes it good material for the very young reader. Three- and four-year-olds will be charmed with the familiar pictures of lights, including the festive Christmas tree and birthday candles; it is to be regretted that the small format prevents the illustrations from being sufficiently clear for the use of the sight-saving class child.

Contributors to This Issue

As a member of the National Society's committee for training medical social workers, **Dr. Conrad Berens** has been active in increasing social service in eye clinics. Dr. Berens is on the staff of the Manhattan Eye and Ear Infirmary, the Lighthouse Clinic and the eye clinic of the Seamen's Institute, and has seen the good results of active follow-up in eye cases.

Miss C. Edith Kerby is the statistician on the staff of the National Society. The study which she reports was activated by several prominent ophthalmologists in New York City who saw with increasing alarm the numbers of preventable eye accidents occurring in childhood.

Dr. Le Grand H. Hardy, director of eye service at the Fifth Avenue Hospital, is a practicing oculist.

Dr. Bernard Samuels is professor of ophthalmology at the Cornell Medical School, Cornell University, and a practicing oculist.

As supervisor of prevention of blindness of the Missouri Commission for the Blind, **Mrs. Francia Baird Crocker, R.N.,** has seen the development of a prevention of blindness program arising from the social and educational care of the sightless.

Dr. W. A. Plecker is state registrar of vital statistics in Virginia; his program for the enforcement of the laws for ophthalmia neonatorum in that state is fundamentally one which will be applicable to all communities through the departments of vital statistics.

Among the book reviewers: **Dr. Park Lewis,** ophthalmologist in Buffalo and vice-president of the National Society, needs no introduction to readers of the SIGHT-SAVING REVIEW; **Miss Marie Swanson, R.N.,** is state supervisor of school nursing, New York State; **Dr. Hardy** is the author of "Illumination and Eyesight in Industry," in this issue; **Miss Matie M. Carter** is supervisor of sight-saving classes, State Education Department, New York.